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ABSTRACT

Project URBANDOC reports on four years of activity as an Urban Renewal Demonstration Project at the City University of New York. The Project aims toward improvement of bibliographic services in urban affairs. URBANDOC is one of the first of the library-information sciences systems to deal specifically with the social sciences. The final report consists of three volumes: the "Demonstration Report," the "General Manual" (Technical Supplement I) (see LI 002 881), and the "Operations Manual" (Technical Supplement 2) (see LI 002 882). The "Demonstration Report" provides an over-all view of the objectives, features, accomplishments, and conclusions and recommendations of the Project. Appendices contain the Prototype Retrieval Reports, and the Prototype Input Index. (Author/MM)

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Urbandoc-71-1

# Urbandoc/A Bibliographic Information System Demonstration Report

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The Graduate Division, The City University of New York, 1971

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## University Graduate Division

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## Report Design

Dean Marilyn Mikulsky, The City University Graduate Division

# PREFACE

Project URBANDOC is reporting on four years of activity as an Urban Renewal Demonstration Project at The City University of New York. The project evolved from a need for improving bibliographic services in urban affairs – and specifically urban renewal – at a time when computer technology was being incorporated into a wide range of information systems. URBANDOC was one of the first of the library-information science systems to deal specifically with the social sciences.

The final report consists of three volumes: the *Demonstration Report,* the *General Manual* (Technical Supplement 1), and the *Operations Manual* (Technical Supplement 2). Each of these is bound separately and intended for separate distribution. For the most general reader who wishes an over-all view of the objectives, features, accomplishments, and conclusions and recommendations of the project, the *Demonstration Report* should suffice.

The *General Manual* is designed to provide the reader with detailed knowledge of the techniques developed for handling the documents according to library-information science practices as developed by Project URBANDOC. While it also provides an overview of the programming system used by the project, the *Operations Manual* should be consulted for detailed systems analysis, programming, and operations data.

The U.S. Department of Housing and Urban Development has been most generous in its assistance of Project URBANDOC, from project submission to final report. HUD's committment to the Demonstration was as important conceptually as it was economically, and the University's indebtedness is thus two-fold. The President and Deans of the University Graduate Division join the New York City Planning Commission and the URBANDOC staff in thanking the Department for having made possible each of these three final volumes, as well as the entire project.

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# INTRODUCTORY SUMMARY

The objectives, essential features, accomplishments and conclusions summarized below resulted from a demonstration effort that was carried out in the format of a small semi-independent documentation facility located in an academic environment. It should be pointed out that the project would have had essentially the same characteristics if it had been set in the context of a library or an operating agency.

## Objectives

Project URBANDOC was concerned with a particular kind of urban information problem – that posed by the ever-increasing literature on urban affairs. The purpose of the project was to devise and test an automated information system based on techniques already under development in other areas, techniques that employ computer technology to gain better access to technical reports and articles than has hitherto been available. URBANDOC was, therefore, working with the kind of system that uses bibliographic records as its data base, and that services its users by providing them with citations to books, journals, and official documents that seem relevant to their specialized information needs.

The over-all objectives were to be realized through the demonstration of five separate end products. The first two were designed specifically for practitioners in urban development:

### Urban Objectives

(1) A machine-readable file of bibliographic records containing extensive subject analysis, together with the computer programs to search those records in answer to specific subject needs; and (2) A group of publications programs which can use the bibliographic file to produce more generalized subject and other indexes for general distribution.

The first of these end products is exemplified by the prototype *Retrieval Report* (Appendix A); the second is exemplified by the *Input Index* (Appendix B). Neither of them was to be put into operation by URBANDOC, only tested as to feasibility.

### Library-Information Science Objectives

The other three end products were:

(3) A thesaurus of the indexing terminology employed in constructing the analytic portion of the bibliographic file; (4) A segment of the entire project that might be suitable for local use; and (5) A set of project manuals that would describe the entire system in sufficient detail to enable potential users to adapt URBANDOC to their own needs.

These three products – all contained in the two manuals – are intended for the library and information staffs rather than the urban technicians.

## Essential Features

As the objectives indicate, URBANDOC's contribution to the urban scene was to locate sources of information in published documents, not to launch a broadside attack on the entire spectrum of information science. Its essential features were, therefore, those of a discipline now being called Library-Information Science at The City University of New York.

### Project Limitations

Even within the boundaries of Library-Information Science, URBANDOC was a limited endeavor. It was intended to explore rather than exploit all the potentialities of a bibliographic information system for urban affairs. Its document base was "typical" rather than comprehensive; its output consisted of prototypes rather than initial issues of ongoing services. Moreover, the total budget of half a million dollars left little room for testing many alternative courses of action. The essential design of the original submission prevailed over most of the implementation activities.

The final data base consisted of six thousand bibliographic records, far larger than most test bases, but far less than would be expected of an operational information system. The same is true of the staff, which consisted of ten members at its height, with never more than two full-time positions devoted to systems analysis and programming.

### Systems Limitations

In terms of project design, the essential feature was the development of a programming system that utilized as many existing systems as could be found and adapted to the needs of URBANDOC. It started – and finished – as an integrated group of programs that could all be executed on IBM 1401 computing equipment. They depended upon an input that consisted of bibliographic records created by manual indexing, or document analysis.

Although URBANDOC was essentially a product of second-generation computing languages and equipment, the staff did give considerable thought to both the advantages and the problems of the emerging third-generation environment.

### Activity Span

URBANDOC's work was divided between purely developmental activities and those that simulated production. The production part started with the initiation of contacts with document-producing agencies and publishers. The documents were then acquired, and six thousand of them selected for inclusion in the demonstration system. From then on, they were subject to all the analytical and data entry procedures that resulted from the developmental side of the project.

At the other end of the production-type work flow, there were both internal uses of the system to test publications and retrieval capability, and field-test issues of the *Input Index* and *Retrieval Reports* to secure feedback from representatives of the potential client community. The output side included all the computer processing necessary to produce the bibliographic products, and all the supporting services necessary for their reproduction.

### Field Testing

As a demonstration project, URBANDOC felt it necessary to expose its products to public scrutiny in time to secure and utilize feedback from potential users. The concept of field-test publications was therefore devised, and a great deal of time devoted to its implementation. First the Thesaurus, then the *Input Index*, and finally the *Retrieval Report* were distributed to a variety of urban professionals.

The *Input Index* was tested most extensively: four editions were produced and evaluated before URBANDOC settled on the present one as the most satisfactory within the various project limitations. About five thousand individuals were involved in the entire series of field tests as recipients of field-test products, some of them several times.

## Accomplishments

The accomplishments of Project URBANDOC are manifested in two formal ways: in the programming system that was submitted to HUD in the form of tapes, punched cards, and printout listings, and in the written report.

### The System

URBANDOC used as the core of its system a set of computer programs from the IBM Program Library: the Combined File Search System (CFS). It fulfilled the majority of URBANDOC's requirements in the areas of thesaurus, file maintenance, and search as well as allowing for a gradual expansion to a total systems approach. This set of programs was designed for use on the IBM 1401 computer. CFS – with modifications by URBANDOC and other users – provided the project with its retrieval capability.

The publications capability was URBANDOC-designed and -programmed. Originally in AUTOCODER, the programs were converted to COBOL in order to make them machine-independent. To them was added another group of programs to perform various editing functions; these also are machine-independent. Together, the two groups, or modules, constitute the local subsystem.

### The Documentation

The documentation is more detailed than usual. Although the original project documents made little reference to this responsibility, the systems staff that came into HUD during the project furnished a great amount of guidance. The documentation includes program inventories, abstracts, input and tape specifications, data entry procedures, descriptions of processing cycles, operating instructions, error listings and systems messages, tape library and report controls, timing and local implementation.

### The Products

The final consumer products are illustrated by the *Input Index* and the *Retrieval Report*. In general appearance as well as in function they are in line with similar computer-produced bibliographic services in the fields of medicine, space, chemistry, and education.

Had computer-assisted typesetting been available, the similarities would have been even greater.

The Thesaurus is contained in the appendix to the *General Manual*. Even during the final days of report writing, the project was still receiving requests for the Thesaurus that had been generated by the appearance of the field-test edition in 1967. Although the final version will be over a year old by the time it is ready for distribution, inquirers will be notified as to its availability.

The local subsystem is harder to visualize except in terms of varying the *Input Index* to meet local needs. A simplified version of the retrieval capability would have been possible, but would cause too many problems.

The project manuals, on the other hand, can not only be visualized but read in their entirety. The *General Manual* includes all the directives necessary for creating the bibliographic records that support the system. The chapters on descriptive analysis, content analysis, and search are extensive. Those on the computer components are designed basically for the non-systems readers. The systems people have an entire *Operations Manual.*

### Operational Data and Cost Analysis

One important result of URBANDOC's production-type activities was that the project could furnish meaningful data for operational and cost-analysis purposes. The results — manifested in Chapter VII of this report — contribute to the literature of library-information science figures that are not easily available elsewhere. They are based on a five-month simulation-of-production period.

The idea of product/process schedules — proposed by HUD — enabled the project to study the inputs and outputs of each individual activity necessary to carry on an operational bibliographic information system. The resulting item counts, manning data, and machine times provided quantitative measures and physical descriptions of information processes that are sometimes difficult to conceptualize in terms of the real world.

Another benefit of the operational data anlaysis was that it led directly to the cost analysis. Personnel and machine costs were studied in detail, with separate costs assigned to each of the product process schedules. One of the most significant findings was the direct unit cost associated with preparing one item of input in an environment that could manage an annual input of ten thousand documents per year. This was $11.54 for personnel, and $1.56 for equipment.

## Conclusions and Recommendations

### On Limited Projects

Although satisfied that it completed its mission successfully, URBANDOC would not recommend that a second-generation system be used in the future for other than training purposes. There are still lessons about library-information science to be learned apart from the data-processing components. However, the effort necessary to make a system work is so great that any investment in another "limited" project should be carefully considered.

**On Operational Systems**

That operational systems can be constructed for index-type publications has been successfully demonstrated. The retrieval capability of information systems has still not been completely proven to be economically feasible. However, the URBANDOC experience indicates that certain kinds of retrievals are more feasible than others, and that further work is certainly warranted in view of the great need to control urban information.

**On Economic Feasibility**

Although it has not been determined by professional market survey, there does appear to be a real demand for a documentation effort in urban affairs. Whether this includes an *effective* demand (i.e., a willingness to pay) for the proposed products and services remains to be determined. It also appears that any documentation effort, whether based on both a publications and a retrieval capability or solely on a publications and a retrieval capability or solely on a publications effort, cannot yet be self-supporting, and that the additional funds required to support such an operation must come from the federal government. (The factors leading to these conclusions and recommendations are discussed in greater detail in Chapter VIII.)

# PROJECT BACKGROUND

## Originating Environment

The name "URBANDOC" now identifies an experiment in the application of computer technology to the documentation of the literature on urban renewal. As an Urban Renewal Demonstration Project, URBANDOC started its work on July 1, 1965, with the aid of a grant to The City University of New York from the Housing and Home Finance Agency – Urban Renewal Administration. This became the Department of Housing and Urban Development (HUD) in 1965-66.

As a concept, URBANDOC dates back even earlier, to a pilot study with the same name that reported to the 1964 Annual Conference of the American Institute of Planners.◇ The Taconic Foundation of New York had made it possible for a task force to be assembled for the express purpose of demonstrating prototype information services geared to the needs of urban specialists. The impetus came from a merger of the information interests – data and library – of the New York City Department of City Planning; much of the work was done in what is now called the Interdepartmental Housing and Planning Library, with the then librarian becoming the project director.

The 1964 effort had created a machine-readable bibliographic file that represented two hundred relevant documents, and utilized a group of computer programs from the IBM Program Library that were similar to programs being used as the basis for documentation efforts in the "hard" sciences. From the various URBANDOC experiments came results indicating that further development was warranted.

The project developed in an environment that included (1) documentation and information science, (2) urban information systems, and (3) planning librarianship.

### Documentation and Information Science

Project URBANDOC was most closely related – in concept as well as in execution – to those developments in information systems known variously as library automation, documentation, and information science. All these systems share the attribute of dealing with bibliographic representations of published materials, whether the goal is to speed up existing operations (circulation control, accounting, and catalogue card production) or to store and retrieve references to satisfy highly individualized information requirements (the use of models in transportation planning).

URBANDOC's interest was less in the purely automative functions, and more in the bibliographic service area, such as information storage and retrieval and the production of multiple-access indexes. Both of these already had operating precedents in such fields as medicine, space technology, and engineering. These precedents – in theory as well as in application – were to be adapted, if possible, to the requirements of the urban literature.

◇Vivian S. Sessions, *URBANDOC: A Report on Computerized Documentation and Information Retrieval in the Literature of Urban Planning and Renewal* (New York: Institute of Public Administration, 1964), 24 pp. See *also*, Howard Bentley and Richard May, Jr., "URBANDOC, a Cooperative Project of Librarians and Planners." In *Special Libraries* (April 1965), pp. 244-246.

Since URBANDOC did not start with fundamentally new responsibilities in information science, it is pertinent to inquire as to the state of the art on which it so depended. During the very period (May-September 1965) when URBANDOC was firming up as a federally-aided project in the hitherto untouched social sciences, the Systems Development Corporation was studying documentation in science and technology for the Committee on Scientific and Technical information (COSATI). The report that resulted is an excellent guide to the plans and accomplishments of the time.◇

In 1965 there fewer projects than now, certainly fewer that had reached operational status. However, then and throughout the demonstration period, URBANDOC devoted considerable effort to keeping in touch with relevant developments. Local and national meetings of the American Society for Information Science and the Special Libraries Association provided a great many opportunities for seeking the benefit of outside experience. The literature of documentation, the project's many personal contacts, and various specialized meetings also helped to keep open the avenues of communication.

### Urban Information Systems

Although the intellectual and technological basis of URBANDOC was in documentation and information science, to the urban professionals it was a specific kind of urban information system. The project encouraged the viewpoint that references to specific documents were no less important, in the over-all information universe, than statistics and other discrete data items, especially if the data items have to be located via bibliographic systems.

Much of the original impetus for the demonstration came from contact with those members of the planning profession who were investigating the applicability of data processing to their own problems. Both the American Institute of Planners (AIP) and the American Society of Planning Officials (ASPO) scheduled discussions on data processing at their annual conferences from 1960 on, with models, data banks, and computer graphics receiving their share of attention. By the time that URBANDOC was officially underway in 1965, the interest in computer technology had spread to other important segments of the urban development community. The Urban and Regional Information Systems Association (founded in 1966) became one focus of the spreading interest; another was the Annual Symposium on the Application of Computers to Urban Problems, initiated by the New York section of the Association for Computing Machinery a year later.

The interaction between URBANDOC and the urban information community had considerable effect on the project. Some of the earlier associates became members of the National Advisory Council for the demonstration, as elaborated later in this chapter. After that, the greatest single effect was, perhaps, the sharpening of the project's awareness of the need for sophisticated geographic access to the literature.

◇Launor F. Carter and others, *National Document-Handling Systems for Science and Technology* (New York: Wiley, 1967), 344 pp., including selected bibliography.

**Planning Librarianship**

The awareness of urban information systems, and the bridge between those applications of computer technology and documentation, was provided by planning librarianship. Although that library specialty is not nearly as well known as the older specialties dealing with the medical and legal literature, it too has a national organization, the Council of Planning Librarians (CPL), and even independent representation on the Council of National Library Associations. Organized in 1959, CPL has grown steadily in membership, size of book collections and numbers of users serviced. The largest portion of its members serve either governmental agencies concerned with physical planning and urban development or university library collections related to planning and architecture.

Related by subject interest is the Planning, Building and Housing Section of the Special Libraries Association. Established as a Section of the Social Science Division in 1961, its members serve a widely diversified group of institutions, ranging from advertising agencies, trade associations and publishing companies to institutions similar to those served by the council. Many section members are also council members.

On several occasions in the early 1960's, the Council of Planning Librarians attempted to solve a serious problem in that branch of the profession: the limited number and usefulness of existing bibliographic tools. There were frequent discussions at its annual meetings of an indexing-abstracting journal, an idea that received favorable comment throughout the planning community. However, attempts to interest funding agencies had not been successful until the time that URBANDOC announced an index publication as one of its goals.

Also under discussion by CPL during that period was the development of a subject-heading list. The Thesaurus to be compiled by URBANDOC was a response both to that need and to the internal needs of the project. In order to fulfill its retrieval responsibilities, URBANDOC had to devise an indexing terminology appropriate for a data base designed for computer searching. Its second responsibility in this area was for terms that could be used as the basis for a subject approach in the projected index journal. As the project progressed, there was a growing emphasis on terms with "stand-alone" value, and the URBANDOC Thesaurus became looked upon by many librarians as a guide to the development of their own specialized subject terminology, one that could be used in conjunction with the 1962 Subject Heading List of the HHFA Library.

Throughout its duration, URBANDOC maintained close association with both the Council of Planning Librarians and the Planning, Building, and Housing Section. From their memberships came very useful and perceptive critics of Project URBANDOC.

## Demonstration Status

The pilot operations of URBANDOC confirmed the general impression that considerable work would be necessary to the development of a computerized information storage and retrieval system that could meet the needs of both practitioners and librarians in the urban field. The Urban Renewal Demonstration Grant Program in what is now HUD appeared to be a logical source of funds, and the necessary contacts were initiated.

**Local Sponsorship**

To meet requirements for status as a demonstration project, more formal institutional relationships were required than had been necessary under the Taconic grant. By this time, The City University of New York (CUNY) had become interested in the project, and the university decided to provide the official local sponsorship with all of the accompanying responsibilities of that status. The New York City Planning Commission offered to be joint sponsor.

In May 1966, The City University applied to HUD for a grant; in June 1966, Urban Renewal Demonstration New York D-9 was approved. In 1968, the original grant was augmented to provide for an additional year.

Throughout this period, the administration of URBANDOC in terms of fiscal and personnel management was handled by the Research Foundation of The City University of New York under the terms of a third-party contract between the foundation and the university, and approved by HUD. Both the foundation and the project were located at the Graduate Center. The president of the University Graduate Division was in effect the principal university official in all policy matters affecting URBANDOC. Formal relationships with other parts of the university – such as Baruch College – were handled through her office.

**Objectives**

The specific objective of the URBANDOC demonstration was to develop and test an automated information system involving the storage and retrieval of bibliographic references to those published materials which are the tools of the trade for urban planning and renewal practitioners. Computer technology was to be an integral component in the methodology, but the specific goals were to be five products of a computerized system rather than the system itself.

The project was approved to do the following:

1. Construct a thesaurus of the indexing terminology;

2. Produce bibliographic references as a result of computer searches of a bibliographic data base;

3. Generate hard-copy indexes by computer publication programs;

4. Designate appropriate parts of the total effort as local subsystems;

5. Produce manuals covering the project methodology.

Although not one of these tasks could be undertaken lightly, the intent was for a project of limited scope as compared with all the possibilities for exploring bibliographic information systems that might have been assigned. The development of computer systems was held to a minimum; the literature was sampled rather than covered in full;

the products of the searches and publications programs were prototypes rather than the initial efforts of operating systems.

**Advisory Council**

One important characteristic of URBANDOC was the official presence of a National Advisory Council. Its members were chosen for both their expertise in relevant areas of information science and their ability to represent important segments of the potential user community.

All of the original members, except the chairman, were chosen from outside New York City to guarantee the national focus. Their names and their affiliations in both 1965 and 1969 are listed below to indicate the types of potential users and systems experts whose guidance, criticism and evaluation contributed in the development of the project. (Asterisks designate members who served for the complete active life of the project.)

*The Hon. Lawrence M. Orton (Chairman)
Commissioner and later Vice-Chairman, New York City Planning Commission

*Mr. Joseph Benson, Chief Librarian
Chicago Municipal Reference Library
(Mr. Benson is now Chief Librarian of the Joint Reference Library, Chicago)

*Mr. Charles A. Blessing, Director of City Planning
City of Detroit

*Dr. Bernard M. Fry, Director
Clearinghouse for Federal Scientific and Technical Information, Springfield Va.
(Dr. Fry is now Dean, Graduate Library School, Indiana University)

*Dr. Robert M. Hayes, Professor of Library Science
University of California at Los Angeles
(Dr. Hayes is also now Director, Institute of Library Research, UCLA.)

*Mr. Edward F.R. Hearle, Director
Data System Services, Griffenhagen-Kroeger, Inc., San Francisco
(Mr. Hearle is now Vice-President of Booz, Allen and Hamilton, Inc., Washington, D.C.)

*Mr. John D. Lange, Executive Director
National Association of Housing and Redevelopment Officials, Washington, D.C.

Mr. Dennis O'Harrow (died in 1968), Executive Director
American Society of Planning Officials, Chicago, succeeded in 1969 by Mr. Israel Stollman

*Mr. Robert B. Pease, Executive Director
Urban Redevelopment Authority of Pittsburgh
(Mr. Pease is now Executive Director, Allegheny Conference on Community Development)

Mr. Herman G. Pope, Executive Director
Public Administration Service, Chicago, succeeded in 1966 by
Mr. Jacque K. Boyer, Director of Headquarters Services, Public Administration Service

*Mr. Robert L. Williams, Executive Director
American Institute of Planners, Washington, D.C.

In 1966 two additional appointments were made to the Advisory Council:

Dr. Donald L. Foley, Chairman
Department of City and Regional Planning,
University of California at Berkeley

Dr. Theodore L. Hines, Professor of Library Science
Columbia University

The council met formally on ten occasions, eight times in New York and twice in Washington. These meetings were also attended by the project director and key members of the staff, as well as representatives of the local sponsors and HUD. The director of the Demonstration Grant Program and the director of the HUD Library were always present or represented. Aside from the formal meetings of the Advisory Council, individual members were frequently consulted by mail or telephone, or in person at meetings of the organizations mentioned earlier in this chapter.

## Implementation

### Project Staff

Helpful as the sponsors and advisors were, the actual implementation of the work program was of necessity a staff responsibility. The librarian who had developed the pilot project was designated as project director. It was her responsibility to recruit and train the other professionals who would be required, subject to the approval of the university. Two basic kinds of technical positions developed – document analysts-librarians and systems analysts-programmers. When the staff was at its largest there were three analysts in each category, plus two secretaries and a keypunch operator.

The director, senior systems analyst, and senior document analyst were with URBANDOC for its entire active life. Six other librarians and three other programmers worked for the project for varying periods of time. The more permanent members of the staff felt that turnover would have been even lower had there been assurances of continuing federal support.

Although the total number of professionals involved was too limited to permit sweeping generalizations about recruitment, project experience indicates that recent graduates of library schools are excellent candidates for jobs as document analysts. This is particularly true of candidates who had taken one or more courses in information science. However, it was essential that their interest in computer applications be as least equalled by strong interests in the intellectual problems of cataloging and indexing. The reason for emphasizing recent schooling is that more experienced librarians often seemed to have difficulty in adjusting to a machine-based system. A large operational documentation facility – with extensive in-service training opportunities – would be in a better position to remedy this situation than was possible in a demonstration effort.

The decision to recruit document analysts from the library community rather than from amongst the planners and other urban professionals stemmed partially from experience during the pilot period (Taconic Foundation funding). It appeared that although the non-librarians had a great deal to offer in the way of understanding the literature, their lack of training in the techniques of indexing and cataloging was too serious a handicap to be overcome by a demonstration project. Furthermore, tentative investigations into possible candidates indicated that it would be difficult to attract urban professionals with sufficient competence, since the jobs was both documentation-oriented and of a temporary nature. (The latter constraint was less of a problem to the librarians, who tended to view a stint with URBANDOC as a way of gaining experience and on-the-job training in a new and attractive part of their own profession.)

On the systems side of recruitment, the first requirement was over-all systems and programming competence. Here too, flexibility was essential. Bibliographic information systems – and a demonstration project environment – are quite different from the business world in which systems analysts and programmers usually operate. Fortunately, it was possible to attract staff members who were not only competent and flexible, but willing to learn a new kind of application of computer technology. Since fewer positions and fewer recruits were involved in the systems part of the URBANDOC staff, the project had too little experience with this kind of recruitment to warrant many recommendations for future URBANDOC-type efforts.

If the matter of project staff seems to be receiving more than its proportionate amount of attention in this report, it is because in-house capability was at a premium in a situation where outside consultants were not provided for in the project budget. There was, however, un-paid input from many external sources. Members of the National Advisory Council were "built-in" consultants who received no remuneration other than travel expenses. Representatives from equipment manufacturers, especially IBM, users of systems similar to URBANDOC such as *Engineering Index*, and the National Institute of Mental Health made themselves available to discuss individual and mutual concerns, as did users of different systems, e.g., the American Petroleum Institute. The URBANDOC staff talked with professional colleagues active in documentation and systems development at seminars, conferences, and meetings.

**Project Facilities**

Project offices were located at The City University Graduate Center. Because the Graduate Center had not yet installed its own data-processing facilities in 1965, computer time was made available at other New York City installations. In 1966, arrangements were completed for URBANDOC to use the newly-acquired facilities at the Computer Center of Baruch College, a senior college of the university. The Baruch College computer was used approximately eight to ten hours per week.

The only data-processing equipment at the URBANDOC offices were a keypunch machine and, for a time, another encoding device which created data input on magnetic tape. The computer system operating tapes and the tapes containing the bibliographic records were kept at the Computer Center. However, printouts as "hard copy" of the computer processing were always returned to the office for examination. Those copies with listings that pertained to the bibliographic records were kept near the physical collection of the books, reports, and journals.

Although URBANDOC did not attempt to operate as a library, the materials that had been entered into the system were retained for future staff use, stored in vertical files in the same sequence in which their bibliographic representations were stored on computer tape. On those occasions when the project received outside requests for access to the materials, the document analysts took turns furnishing the necessary personnel services.

The experience gained from these encounters with "live" users more than compensated for the small loss in operating efficiency. They also tested the ability of various spinoff printouts to serve as manual bibliographic tools.

**Work Program**

The design of a work program scheduling anticipated activities necessary to carry out the objectives of the project was included in the 1965 grant application. After four years, the schedule can still provide useful guidelines for other institutions considering computerization for information storage and retrieval. A synopsis of the project activities in chart form, arranged chronologically with the years subdivided into quarters as required for the project's progress reports to HUD, follows.

The major alteration in the original work program was the time change from three to four years. Substantial enlargement of the data-processing effort was one of the factors in requesting augmentation of the grant. Other factors were the time needed to originate cost-analysis information and the development of manuals for publication of the project's detailed procedures.

**Project Staff Composition by Function**

**Original 3-year period**

| | 1965 | | 1966 | | | | 1967 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | July-Sept. 1st Q. | Oct.-Dec. 2nd Q. | Jan.-Mar. 3rd Q. | Apr.-June 4th Q. | July-Sept. 5th Q. | Oct.-Dec. 6th Q. | Jan.-Mar. 7th Q. | Apr.-June 8th Q. | July-Sept. 9th Q. | Oct.-Dec. 10th Q. |
| PD | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| SA | 1 | 1 | 1 | 1 | 1 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| DA | 0 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| OS | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| KP | 0 | 0.5 | 0.5 | 0.5 | 1 | 1 | 1 | 1 | 1 | 1 |

**Extension period**

| | 1968 | | 1968 | | 1969 | | | |
|---|---|---|---|---|---|---|---|---|
| | Jan.-Mar. 11th Q. | Apr.-June 12th Q. | July-Sept. 13th Q. | Oct.-Dec. 14th Q. | Jan.-Mar. 15th Q. | Apr.-June 16th Q. | July-Sept. 18th Q. | Oct.-Dec. 18th Q. |
| PD | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0.5 |
| SA | 1.5 | 1.5 | 1 | 2.5 | 2.5 | 2.5 | 1.5 | 1 |
| DA | 3 | 3 | 2 | 3 | 3 | 2.5 | 1 | 1 |
| OS | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 |
| KP | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 |

Legend:

| | | | |
|---|---|---|---|
| PD | Project direction | DA | Document analysis |
| SA | Systems analysis (and programming) | OS | Office services |
| | | KP | Keypunching |

**Project Activities by Intensity and Project Quarter**

| Original 3 years | | | | | | | | | | 4th year | | | | | | | Reporting only |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1965 | | | 1966 | | | 1967 | | | | 1968 | | | | 1969 | | |
| | 1Q | 2Q | 3Q | 4Q | 5Q | 6Q | 7Q | 8Q | 9Q | 10Q | 11Q | 12Q | 13Q | 14Q | 15Q | 16Q | 17Q | 18Q |
| Administrative activities | | | | | | | | | | | | | | | | | | |
| General, incl. training, internal systems, | + | x | = | = | = | x | = | = | = | = | = | x | = | x | = | = | = | = |
| Advisory Council (x indicates meetings) | + | x | x | x | = | x | x | x | = | x | x | x | = | = | x | = | | |
| Thesaurus development | | | | | | | | | | | | | | | | | | |
| Subject analysis | | + | $x^{1}$ | x | x | = | x | $x^{4}$ | $=^{6}$ | x | = | = | = | x | = | =) | | |
| Geographic analysis | | | + | + | + | $x^{3}$ | = | = | = | x | = | = | = | x | = | $=)^{15}$ | | |
| Systems development and language conversion | + | x | $x^{2}$ | x | x | x | x | x | x | x | x | = | x | $x^{11}$ | x | = | = | = |
| Input Activities | | | | | | | | | | | | | | | | | | |
| document base: acquisition, selection, and identification | | + | x | x | = | = | = | = | = | x | = | = | x | = | = | = | | |
| Document analysis (indexing) | | | + | x | x | x | x | x | x | x | x | = | x | x | x | $=^{16}$ | | |
| Information storage (data entry, editing and validation, input processing) | + | + | + | + | + | x | x | | $x^{5}$ | x | x | = | $x^{10}$ | x | x | = | = | = |
| Product development (Publication and retrieval) | | | + | + | + | + | x | x | x | $x^{7}$ | $x^{8}$ | $x^{9}$ | = | $x^{12}$ | $x^{13}$ | $=^{17}$ | = | |
| Reporting activities | | | | | | | | | | | | | | | | | | |
| Operational and cost analysis | | | | | | + | | | | + | | | | + | $x^{14}$ | = | | |
| Major reports and manuals | | | | | | | | | | + | + | x | = | = | x | $x^{18}$ | x | x |

Legend
- + Activitiy start-up or preliminary period
- x Key punch
- = Maintenance period

Footnotes refer to comment points on the following pages.

**Project Activity Comment Points (Chronologically)**

1. Review of the Thesaurus by panel
2. CFS Users' Group begun
3. Adoption of Census Bureau Geographic Identification
4. Thesaurus Field Test, first printing
5. Start of DATATEXT experiment for data entry (continued for 2 quarters)
6. Thesaurus Field Test, second printing; Thesaurus transmitted to Clearinghouse for Federal Scientific and Technical Information for further distribution
7. Input Index #1 distributed
8. Input Index #2 distributed
9. Input Index #3 and Cumulative Index #1 distributed
10. Input to Document File #1 closed with 4000 documents
11. Start of language conversion for program in Local Systems Module (from AUTOCODER to COBOL)
12. Search Expansion Programs obtained from the *Engineering Index;* Increased retrieval
13. Input Index #4 distributed
14. Operational Data and Cost Analysis (based on experience of October 1 1968-February 29, 1969) transmitted to HUD
15. Input to Thesaurus closed, both subject and geographic
16. Input to Document File #2 closed with 2000 documents
17. Prototype *Retrieval Reports* distributed at ASPO Conference
18. Draft reports start being submitted to HUD

## GOALS: EVOLUTION AND RESOLUTION

The goals of Project URBANDOC were, as pointed out in the "Introductory Summary", the following. 1. A thesaurus of the indexing terminology; 2. Bibliographic references produced as the result of computer searches; 3. Hard-copy indexes generated by computer publications programs; 4. Local subsystems; 5. Manuals.

These goals were all resolved as physical products, each of them manifested in the three volumes of the final report series. Two of them are exemplified by materials appended to this volume: the sample *Retrieval Report* that constitutes Appendix A is the result of computer searching; the prototype *Input Index* that is Appendix B represents computer publications. The subject Thesaurus is published in its entirety as the Appendix to the *General Manual*. The *General Manual* and the *Operations Manual* together represent the goal of project manuals, as well as provide the directives for the goal of local systems.

This chapter is concerned with the processes by which the original goals were realized, and with the evolutions that took place during their realization. It is basically input-oriented, concerned with the intellectual problems in creating the bibliographic data base. Chapters IV and VI deal with the physical documents represented by the bibliographic data, and with the computer processing required to convert the data base into meaningful physical products. Chapter V considers the output products in the user environment, and discusses the field tests.

### Thesaurus

The URBANDOC Thesaurus was both the first goal to be enunciated by the project and the first product to be submitted to public scrutiny.

#### Function

As used in bibliographic information systems, the word "thesaurus" means an alphabetical listing of the terms used by a particular information facility to index the subject content of its documents. The individual terms in the listing – called descriptors when they are being applied in a computer-aided environment – have appended to them cross references and scope notes that provide guidance for their proper usage. Non-urban bibliographic systems, such as those in the areas of medicine, education, and space each have their own thesauri.

The preparation of at least a draft thesaurus is a necessary prelude to any documentation development in which the computer system requires that the subject analysis be by a controlled vocabulary. At any single point in time, the descriptors in the bibliographic records must be the same as those authorized by the thesaurus.

Although it is technically possible to construct a bibliographic information system that will perform computer searches without a thesaurus, Project URBANDOC is based on a programming system that does require the controlled vocabulary. The Combined File Search System, and the reasons for choosing it, are discussed elsewhere. Although

URBANDOC did examine other ways of handling content analysis, especially in relation to third-generation equipment (such as the IBM System 360), the original purpose of a thesaurus as part of the present demonstration was not changed.

The decision for a controlled-vocabulary system was greatly influenced by the easy availability of the particular set of programs through the IBM Program Library, and by the apparent ease also of implementing the system. However, this decision was backed up by a fundamental theory that content analysis should proceed on an organized basis, and that such organization is well handled by a thesaurus. In conventional library terms, the thesarus is comparable to the subject-heading list; in planning terms, it parallels the land-use classification.

Alternative methods of content analysis, such as "text-processing" systems, depend more on the terminology in the particular document. While each method has its virtues and its supporters, a comparative analysis of the two by far transcends both the goals and the responsibilities of the present demonstration. The text approach did, however, influence URBANDOC in the selection of its descriptors, as is indicated in the following section.

## Descriptor Candidates

### *Word Lists*

There were few published thesauri for computer-aided documentation available when URBANDOC started its work, and they were not useful for the analysis of urban documents. Published candidates for descriptors in the URBANDOC system thus had to be culled from other sources, some of them library-oriented and others user-oriented. Examples of library-oriented sources are subject-heading. lists, such as the one published by the Library of the Housing and Home Finance Agency (later HUD) in 1962 and subject-organized acquisitions lists, such as the "Recent Publications" of the Joint Reference Library in Chicago, which presently appears biweekly.

The other kind of source is best exemplified by the index to the *Urban Renewal Manual* of HUD and by the *Standard Land Use Coding Manual,* published jointly by HUD and the Bureau of Public Roads. The publications and catalogues of the Census Bureau were also a prime source for potential descriptors, since the census compilations provide so much of the data base for all urban research.

The indexes prepared by the professional societies for their own publications – periodical and monographic – were also considered important evidence of how the users of urban information conceptualize its organization. The American Institute of Planners, the American Society of Planning Officials, the Council of State Governments, the International City Managers' Association, and the National Association of Housing and Redevelopment Officials thus all contributed – albeit indirectly – to the URBANDOC indexing terminology.

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*The term "content analysis" is used by URBANDOC to cover both the geographic and the subject analysis of its documents, sometimes also referred to as indexing.

However, URBANDOC realized that all of the word lists already in existence – or that would come into existence during the course of the project – could only provide guidance for the kind of terminology that would best exploit the capabilities of the computer for searching on descriptors either singly or in various combinations of AND, OR, and NOT relationships. (The one other list compiled with a machine usage in mind – the *Urban Thesaurus* of Kent State University – was not available until 1968, well after URBANDOC had completed the bulk of its own thesarus activity.)

Many of the URBANDOC descriptors were suggested for that express purpose by the urban professionals. In this regard the project was fortunate in being able to draw from the pilot work that preceded the federal funding. During the Taconic period the ad hoc task force – composed largely of members of the New York chapter of the American Institute of Planners – met frequently and considered the development of the indexing vocabulary one of its prime responsibilities.*

After the demonstration project had spent six months reviewing the original list and adding to it from published sources, a 1600-term compilation was reviewed (April 1966) by a second, briefly – constituted panel of planners.

Still another source of descriptors was the field test that will be discussed more fully later. Of the six hundred urban professionals and librarians who saw the published Thesaurus of 1967, many contributed still further ideas on how to gain access to the literature by subject. In all these cases of user feedback, the resulting revisions affected not only the choice of terms for descriptors, but also the scope notes and cross references.

### *Word Usages*

In addition to the published word lists and user-suggested descriptors, another guide was the documents themselves, particularly those that were considered central to the urban renewal process. The federal legislation, in particular, was scrutinized for new program-related terms. The term "neighborhood service centers," for example, was added after the 1968 legislation. Speeches, directives, press releases, and any other indication of new concepts were also considered, particularly those emanating from HUD. Other sources were monographs and periodical articles. In this respect the project was most influenced by those methods of machine indexing which depend solely on the words used by the author of the particular document.

A final source of URBANDOC indexing terminology was the curricula and syllabi in relevant university disciplines. Conceptualization is a major concern in the academic approach to urban or any othe; problems, and therefore the organization of the disciplines for teaching purposes would, it seemed, help URBANDOC in its own organization of the terminology. Materials from many major teaching programs were therefore assembled and examined, and they did indeed prove useful, especially for distinguishing usages and providing scope notes.

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*The original group included Robert E. Barraclough, Herman Berkman, Pares C. Bhattacharji, S. Robert Caso, Robert Geneslaw, Samuel Joroff, Lawrence M. Orton, Philip B. Wallick, and Robert L. Wilson. Other planners who participated in that stage were Robert Alpern and Rodman Davis. Between them they represented regional and transportation interests as well as the more strictly urban phases of planning and renewal and also a mixture of governmental, voluntary, consultant, and academic approaches. The 560-word vocabulary that emerged from their deliberations was used in the pilot study, and continued as the basis for the formal thesaurus activity under the demonstration.

### Thesaurus Status

Although the Thesaurus that is appended to the *General Manual* fulfills the original project goal of a published indexing vocabulary, neither it nor a subsequent edition could be legitimately considered a finished work. The urban field is too dynamic for any vocabulary to represent more than the state of the art at a given moment. The field-test version that was distributed in 1967 represented the status of the vocabulary in May of that year. The version in the *General Manual* contains the revisions dictated by two years of added usage, including the feedback and the emergence of new candidates as indicated indicated in the preceeding section. Input to the system ended in June 1969 with six thousand documents, and so did work on the Thesaurus. Although additional terms have undoubtedly become candidates for inclusion since then, work on the final report volumes prevented their inclusion.

Internally, within the amount of information given for the individual descriptors, the Thesaurus is also a state-of-the-art report rather than a final guide to the relationships between the various descriptors. Scope notes were written as the document analysts became aware of their necessity to distinguish usages in particular cases. The Thesaurus is therefore neither a dictionary nor a glossary, although it does make some contributions toward the development of these tools.

It should be pointed out that at any moment in history the published version of the Thesaurus could be out of phase with the tape version that is part of the Combined File Search System. This is because the Thesaurus tape can be updated without making a new printout. For some revisions, it is necessary only that the appropriate notes be added manually to working copies until there are sufficient changes to warrant the expense of printing a new edition.

For those who have to know just how the Thesarus terms have actually been used in indexing documents, the system contains another tape and another printout that provide the answers. The inverted file lists all the descriptors that have so far been entered into the data base, together with a "document number." The number identifies each document for which it plays a part in the content analysis. There is also a listing that tells the last date on which each descriptor was either added to or deleted from the data base.

### Descriptors as Subject Headings

In order for URBANDOC to publish an index, it was necessary to make some decisions about how to provide a subject approach to the literature, whether in the *Input Index* or a similar vehicle for manual use. The obvious way to display bibliographic references by subject is, of course, an alphabetically arranged list of subject terms. The machine capability was provided by the computer programs that URBANDOC devised as part of its "publications module." That capability did not, however, require any particular intellectual method of assigning the subject terms.

URBANDOC's decision to base its *Input Index* subject-heading list on the retrieval-oriented Thesaurus was made after examining the consequences of the alternative of constructing a separate subject-heading list. The most obvious disadvantage of this course of action would be the extra effort involved in learning and maintaining two separate indexing terminologies. Furthermore, a dual system would have militated against the efforts of conventional library operations to start on the road to computerization by experimenting with descriptor-like terms for their interim cataloguing.

However, in order to make the descriptor list provide meaningful terms for the printed subject index, it was necessary to include a sufficient selection of descriptors that could stand alone. This accounts for the occurrence in the present thesarus of so many multi-word descriptors (referred to by the documentalists as "prebound terms"). OPEN HOUSING, CITIZEN PARTICIPATION, and HOME OWNERSHIP PROGRAMS are all examples of concepts that could be handled – for retrieval purposes alone – by linking OPEN with HOUSING, CITIZEN with PARTICIPATION, and so on. This way, they not only make subject headings out of descriptors, but also make it easier to write search statements for the retrieval part of the total system.

The decision to increase the number of "stand-alone" descriptors did present one problem: the inevitable lengthening of the Thesaurus. Eventually, it would also cause the Thesaurus to become loaded with terms that had enjoyed a brief period of popularity and then faded from public consciousness. It would therefore be necessary, in an ongoing operation, to strike a proper balance between single – and multiword descriptors.

### Thesaurus Conventions

The technical considerations involved in devising a thesaurus could constitute a volume in themselves. One of them is the use of "natural language", meaning that the subject descriptors are used as they appear in the printed version; they are not represented by numeric codes. (This is not true for the geographic terms, as is discussed at length in the *General Manual*.) The content analysis was therefore not a matter of coding but of entering appropriate subject terms.

Another consideration is that the terminology was related to the subject concern of the project, urban renewal. Although this was interpreted sufficiently freely that many urban-related disciplines are represented, the present Thesaurus makes no claim to provide the terminology that would be necessary for a project with other subject orientations. URBANDOC was loath to include terms for which it would have no usage experience, and therefore did not take advantage of its freedom in the compilation of the terminology.

In matters of style, URBANDOC generally followed practices common in documentation. Plural forms were preferred to the singular, and nouns to adjectives. Cross references between more specific and more generic forms also followed common practice, although URBANDOC went further in indicating possibilities for coordinating terms as well as "prohibiting" coordinations that might lead to redundancies.

In order to provide greater assistance to the user of the Thesaurus, URBANDOC also made provision for the publication of a "permuted" form, in which there is one listing for every single word in a multiword term. Therefore PLANNING, PLANNING EDUCATION, and TRANSPORTATION PLANNING all appear together with the planning terms as well as in their normal sequence for term-by-term alphabetizing.

## Retrieval

The most challenging part of the URBANDOC mission was the development of the retrieval portion of the over-all system. A typical retrieval might involve finding reports that describe the activities of regional councils regarding environmental protection in a specified Standard Metropolitan Statistical Area.

### Retrieval Results

The end result for the URBANDOC user would be a computer-produced printout that lists such bibliographic elements as author, title, publisher, and any additional information that was stored in the first place, and asked for in the second. (The content and construction of the data base will be discussed at length later in this volume and in the manuals.) Important here is the fact that the typical format of a processing report in retrieval systems is the hard-copy printout made at the central facility. Its transmission to a user at a remote location is still by traditional means of communication.

This is far less dramatic than the dream of the information industry to have a terminal on the desk of every inquirer. However, the chief miracle – the present stage of retrieval development – continues to be in the search process; it is not in more sophisticated ways of communicating with the computer. URBANDOC was far too involved in trying to guarantee the quality of retrieval results to become concerned with other than traditional batch processing.

### Systems Choice

The heart of the URBANDOC search capability was IBM's Combined File Search System (CFS), obtained for URBANDOC from the IBM Program Library. The intent had been, from the beginning, to adopt or adapt an already existing system; the URBANDOC budget and work program made little allowance for major efforts in this area. CFS was considered for adoption even before the formal start of the demonstration in July 1965. The fact that the *Engineering Index*, the National Institute of Mental Health, the Food and Drug Administration, and others were using CFS was a heavy factor in the preliminary decision.

During the early months of the project, considerable time was devoted to learning the system and preliminary tests. A small controlled vocabulary was compiled and some bibliographic records were entered into the system, and searches were made. The initial results indicated that the system could perform sufficiently well to form the basis of the rest of the demonstration. Since there was no other system easily available with the same capabilities, and as well suited to the computing facilities, URBANDOC proceeded to use the CFS, and to make such modifications as became necessary.

**Systems Evaluation**

The evaluation of retrieval systems is a more difficult subject than might seem to be the case. One issue is the programming system; another is the worth of the bibliographic citations as the end result of the search process.

Functionally, the CFS that is the heart of URBANDOC's work in this area performed well. The individual programs accomplish what they set out to accomplish, especially after some initial "debugging." However, the system is not easy to learn, an initial defect. In addition, extraordinary care is required in all the procedures, both input and output (the consequences of errors, and the necessary remedial actions, are discussed in the *Operations Manual*). More automatic editing features might have been contained in the original system, but URBANDOC compensated for this by adding a pre-edit module of its own design.

Efficiency is another matter, one which is difficult to judge in a demonstration environment. URBANDOC was in an especially difficult situation in this regard because it was evaluating a second-generation system (IBM 1401) at a time when everybody was already aware of the greater possibilities claimed for the newer equipment and programming systems. In any case, the staff felt that operating efficiency would be a problem on the existing version of CFS with a large volume of input and requests, but had no opportunity to prove this statistically.

**Search Evaluation – Subject Considerations**

The success of the search system from a content point of view depends on there being a match between the content analysis of the documents and the interests of the user. Both are expressed in the terms of the descriptors in the Thesaurus, and are explained at length in the *General Manual*. However, even the clearest of directives cannot guarantee that the system will produce a relevant document when needed, since there are so many possible ways of expressing concepts, especially in urban affairs.

A great deal of discussion has taken place among the documentalists in attempting to evaluate the results of computing search. Projects associated with the College of Aeronautics (Cranfield, England) have provided the information community with two important criteria: "recall" (the ratio between the number of bibliographic citations that were actually retrieved and number that should have been retrieved) and "relevance" (the ratio between the retrieved citations judged to be relevant and the total number of citations in the retrieval report).

Relevance is, of course, the easier criterion to apply since all the evidence is at hand in the printout that the computer produces when it has finished searching. The URBANDOC staff had two kinds of results to examine: those that answered questions formulated internally for testing purposes, and those submitted by outsiders. Both types of searches appeared to produce highly relevant lists of bibliographic citations. The staff's own impressions in this regard were confirmed by those outside users who provided feedback.

How well the searches functioned in terms of the possibilities of the entire file is more difficult to answer, especially for the outside user who has no knowledge of the preceding input. Once a data base exceeds several hundred items, it is difficult to remember which documents should have been retrieved for a particular formulation of user needs. However, the staff felt reasonably secure that its searches had functioned in this regard also.

Although the entire question of search strategy is discussed fully in the *General Manual*, a few words about the subject descriptors are also in order here. Searches that can be expressed by a single, very precise descriptor have a better chance of success than those that require an imaginative coordination of various possible descriptors. In general, the narrower the concern of the user, the better will be the retrieval: it is obviously easier to find all the references on INDUSTRIAL PARKS than on the entire URBAN ENVIRONMENT. The same is true, of course, for manual information systems, such as library card catalogues. The only difference is that manual systems have generally shown less concern for measuring their response to queries. The real issue in evaluating computerized searches would be whether they function better than their manual counterparts.

In the preceding discussion on search evaluation, the implication has been that the entire master file is being used for "retrospective" searching. There is another use of the search capability, called "selective dissemination of information." In this case, only the new input is being searched, on some kind of regular input cycle. Ordinarily the questions are not new, but a standard "profile" that has been developed for each user or group of users. Since the parameters of the search are known before the document analysis, it is possible to orient the analysis more accurately toward the users in this situation than for the retrospective kind of searching. The performance of URBANDOC in a selective dissemination environment is a matter that the staff would have liked to explore next, had there been sufficient time.

**Search Evaluation – Geographic Considerations**

Geographic analysis always played a large role in URBANDOC thinking because planning and renewal is, after all, for a specific place on the earth's surface. Practitioners in this field have a greater need than most to be able to retrieve on the basis of a specific place.

The project was aware of the problem in relying solely on place names for retrieval. Too frequently an area transcends political boundaries, particularly for metropolitan and regional planning. The original hope had been to define an area by a grid system, such as the coordination of latitude and longitude. Although much effort was spent in trying to find appropriate methods of analysis and retrieval, no manageable choice emerged. The geographic identification systems developing in other parts of the urban information community were not applicable or transferrable to a document-based system. URBANDOC could not develop its own scheme of analysis due to work program and budget considerations.

By the second year the project could no longer postpone some kind of decision and decided that the best solution was to adapt some of the geographic identification work of the Census Bureau for United States materials. The numeric codes published by the bureau in its *Geographic Identification Code Scheme* (1961) were the ones used. The project manuals describe in detail the present capabilities for retrieving documents according to state, county, and local name, range of city size, and Standard Metropolitan Statistical Area. It is a significant advantage that the census system is a national standard, recognized by all renewal and planning agencies; of equal importance is the government's responsibility for updating the Census Bureau Code.

Although the ability to retrieve document references on the basis of city size was not anticipated in the original project goals, the cost of adding this feature was negligible once the Census Bureau code scheme was incorporated into the geographic section of the Thesaurus. It provided an answer to the problem of avoiding a large-city bias, since it was now possible to restrict a search to cities within certain population ranges. The only problem with the present system is its basis on the 1960 census, admittedly out of date for many places. It will require correction after the 1970 enumerations become available.

### Machine Versus Manual Searching

Although the URBANDOC responsibility was to develop machine methods of dealing with bibliographic data bases, manual methods are by no means completely out of the picture. The section on publications that follows deals essentially with a computer-produced tool designed for personal consultation by the user of the system. Certainly a hard-copy index is – at this stage of the URBANDOC art – a better way of browsing through a small file than is the machine retrieval capability.

## Publications

The goal of using the data base and programming system to produce an index journal has always been central to URBANDOC. During the pilot stages, author, title, and subject listings were produced, and sample pages included in the report that was prepared for the American Institute of Planners in 1964. There was a long road to be traveled, however, from there to the present *Input Index*.

Most important, perhaps, was the evolution in the project's thinking about the amount of attention involved in producing a satisfactory index. It had been thought that the index – although an important goal in its own right – could be handled as a by-product of a bibliographic system geared primarily to the goal of machine searching. It turned out that considerable additional effort was involved in almost every aspect of the project in order to achieve the publications goal in the first place, and then to sustain it.

### Publications System

URBANDOC chose its basic programming system, IBM's Combined File Search, with full knowledge that it did not contain a publications module – the group of computer programs that would be necessary to implement the publications goal. However, a careful preliminary examination of the system confirmed the original premise that it would not be difficult to interface the basically search-oriented CFS with the kinds of publications programs that seemed appropriate. The problem was how much of the publications module could be picked up from existing systems, and how much would have to be written by the project.

It turned out that an independent course of action had to be pursued even though there were in existence, by 1965, several generalized publications modules. There would have been no problem in obtaining the permuted title index programs from IBM known as KWIC (Key Word in Context) and KWOC (Key Word Out of Context). The KWIC-type programs were judged unsatisfactory since their strength was in manipulating titles, and titles in urban affairs rarely improve with permutation. In addition, the records were not long enough to accommodate all the bibliographic data that were associated with the URBANDOC documents, especially the lengthy corporate names.

Additional problems arose when publications modules used by other documentation centers were investigated. Some of them were of a proprietary nature, and thus not readily available. Others – from federal sources – were not adaptable to the data processing that was to be available to URBANDOC. Without access to computer-assisted means for composing type, for example, URBANDOC would have to depend entirely on the format capabilities of the IBM 1401 computer in conjunction with the 1403 printer.

Despite these constraints, the staff designed a publications module that it considers one of the project's major systems achievements. The system interfaces completely with CFS, thus permitting URBANDOC to use the same input for both publications and search. The programs can be used either with the current input, to produce current indexes, or with the larger master file, to produce indexes to the entire data base. There is also great flexibility in the way individual data elements are originally identified and later selected for listing, thus allowing for many versions of the *Input Index* without the need to reprogram.

The publications module can also be used independently in a documentation facility that is not interested in computer searching, only in producing a printed index. These various possibilities, as well as the details of the module itself, are discussed in both the *General Manual* and the *Operations Manual*. Further discussion on the evolution of the *Input Index* as an identifiable product of the publications module is contained in Chapter V, "Product Development".

## Descriptive Analysis

The effect of the *Input Index* on the indexing vocabulary has already been mentioned. However, the URBANDOC experience indicates that subject is a less secure access point to the literature than author, title, and other definitive items of bibliographic information. (The matter of data elements is discussed at length in the *General Manual*.) It was through the process of exploiting these other approaches to the document base and turning them into a useful product, that URBANDOC fully realized the significance of descriptive cataloguing, which URBANDOC prefers to consider under the more inclusive term "descriptive analysis."

The project had started with a greater interest in the content analysis than in the descriptive part of the task, and assumed that existing library methods of recording author, title, and the other basic bibliographic data would suffice.

Examination indicated that the COSATI authority rules were not prepared to handle many of the problems encountered by URBANDOC, particularly those of corporate author. The reason was that COSATI was mostly interested in the scientific and technical documents, and had devoted its attention to the handling of company names, particularly those of the nationally known corporations with many local installations that had to be differentiated, such as General Electric. It had little or no experience with the many state, regional, and urban agencies contributing to the URBANDOC data base. URBANDOC's own staff therefore had to take on the rather onerous task of establishing workable rules for handling these subnational corporate entries in ways that were consistent with the spirit, if not the letter, of the new national standards.

The *General Manual* sets forth the present principles of the URBANDOC bibliographic record and compares it with the more familiar library catalogue card. Included is an explanation of data elements and the methodology for identifying them – important considerations when using the bibliographic record to support a publications program. (See chapter II, "Document Identification," for an explanation of the order in which references appear in the *Input Index*.) All the sources reviewed by URBANDOC in the compilation of its descriptive methodology are listed in the bibliography accompanying the manual.

## Local Subsystems

The fourth goal of the URBANDOC demonstration related to local systems emanates from the desire of many institutions (agencies and universities in particular) for directives that would enable them to use the URBANDOC programs internally. It was first necessary to discover what kind of use was contemplated. Use of URBANDOC programs could be based on either the retrieval or the publications capability. Emphasis was placed at first on retrieval: local ability to search centrally produced URBANDOC tapes or the ability to construct and search their own searchable files. Unfortunately, neither kind of interest in local retrieval capabilities appears feasible in many situations. The high level of systems support for retrieval operations is discussed in the *General Manual*.

As an alternative course of action, URBANDOC recommends the use of the publications programs as the core of a local system. Despite their lower status in terms of glamour, the publications programs have a great deal to offer. The records created by these programs can be used to produce manual tools, which in turn can provide limited retrieval capability when searched. The possibilities illustrated by the *Input Index* are extensive. URBANDOC recommends that they furnish the basis for local exploration into bibliographic control.

In the complete URBANDOC system, input data are processed first by the edit programs and then by the file-maintenance programs (to build the searchable files) and by the publications programs (to build the publications files). The system is sufficiently flexible, however, to allow data from the edit programs to be processed directly by the publications programs. (These procedures are explained in the *Operations Manual*.) With publications, as with retrieval, it is theoretically possible to construct one's own data base and/or use bibliographic tapes created elsewhere as input to a local system. The first course of action would seem to present the least difficulty, regardless of the nature of the data. However, with either course of action, the importance of edited data (and, in turn, of the edit programs) becomes self-evident.

## Manuals

One of the most important parts of the project's mission was to produce manuals describing in detail the various components of the system – both the programs and the data they were to process. The written documentation would serve several purposes: to provide guidance for those people who might be called upon in the future to implement all or part of the URBANDOC system; to provide a record of how the project fulfilled its various tasks; and to record URBANDOC's experience for the profession of library-information science.

The material is presented in two sections: the *General Manual* and the *Operations Manual*. The *General Manual* contains all the procedures applicable to document analysis, as well as the general approach to the programming system. The *Operations Manual* contains the details of the programming system, as well as such program-connected details on the input as data entry and error detection and correction.

# THE DOCUMENT BASE

No bibliographic information system can be better than the document base that it represents. The physical books, articles, and reports must be acquired and identified before they can be subjected to the analytical procedures that create the bibliographic records. The first three-quarters of this chapter present the considerations that go into the construction of the document base.

After the individual items are no longer needed by the document analysts, they can be either stored, sent to another document collection or library, or discarded. Which course of action is adopted depends on the plans for providing physical access to the documents subsequent to the kinds of bibliographic access that are provided by the information system. Although physical access was not originally an URBANDOC responsibility, some discussion of it appears indicated by the questions that have come to the project, and this is handled by the last section of this chapter.

## Scope and Limitations

The HUD grant to The City University of New York established URBANDOC's concern as a "system for storing and retrieving bibliographic references to published materials used by urban renewal and planning technicians."

There was no itemization of particular subject areas to be covered, and this left the project free to determine the specifics of its document base. It became evident that any statement of coverage by subject could be only the first step in defining scope, and that other statements would have to be developed to deal with documents according to their sources, their currency, and their relationship to copyright protection.

### Subjects

In May 1966, toward the end of the first year, URBANDOC submitted to HUD a statement that established the following principles for determining scope in regards to subject:

> The density (breadth plus depth) of the URBANDOC coverage must be greatest for that literature which is unique to urban renewal: written by and/or for the professional practitioners. In the first ring away from this core are those materials where a specific relevance is readily apparent, either in the text or because of close and well-known association. By definition, the latter includes comprehensive planning at the various levels of government, as the context within which renewal is effectuated. Radiating out toward an eventual finite boundary of inadmissibility lie those books and documents whose prime utility is for other activities, but whose relevance to the slum blight problem is sufficient to warrant inclusion as resources permit.

The document base built by the project was reasonably consistent with this early definition of parameters, although later events made some expansions inevitable. The emergence of the Model Cities Program, the increased emphasis on the private sector, and the evolution of planning itself were all reflected by the addition of sample documents. Some coverage of urban information systems was also inevitable in terms of the project's own view of bibliographic information systems as part of a larger picture. However, the essentially limited nature of the project did not permit the kinds of expansion that might have made the final prototype products more truly reflective of the current literature on urban affairs.

The best single measure of the project's awareness of its subject responsibility is the final version of the Thesaurus as it appears in the Appendix to the *General Manual*. Since it cannot enumerate the actual uses of the various terms, it is only a partial measure. Of possible descriptors it does show the parameters, the general considerations and the areas in which specificity was desired. The listing does not, obviously, include any terms that might have become necessary since input to the Thesaurus ended in June 1969; it does not include terms that mught have been necessary in an urban bibliographic information system that was aided by a federal program other than the Urban Renewal Demonstration Grant program.

**Sources**

URBANDOC policy for defining scope statements now contains, as the result of four years of experience, a source statement. The reason is the proliferation of the literature to the point where no system can guarantee coverage of an entire field. It is therefore of primary importance for the user to know which documents have been covered by a particular information system, and which remain to be covered.

Potential sources include publishers, issuing agencies, funding agencies. The publishers are not only commercial presses, but also professional societies, foundations, voluntary organizations of various kinds, and academic institutions. They may also be consultants and industry groups. Issuing agencies, particularly for urban planning and renewal, are federal, state, and local bodies. Both publishers and issuing agencies have to be solicited individually by the bibliographic system. In the case of URBANDOC, particular sources were suggested by the American Institute of Planners, and then contacted by letters describing the project and requesting cooperation. A great many documents, including periodicals, were received by this means during the time that the staff was putting records into the system.

The third type of source, funding body, is exemplified by the Urban Planning Assistance Program of the Department of Housing and Urban Development. Although usually it is not the body that issues the report, it can issue directives to grantees regarding distribution of the published results of its aided projects. A listing of the cooperating funding sources will also help define the coverage of a particular bibliographic information system.

During the URBANDOC demonstration, there was one funding body source, the HUD program mentioned above. The agencies receiving Urban Planning Assistance Program grants were asked to send one copy of every report to URBANDOC, as part of a Depository Library System. Not all the reports were entered into the URBANDOC system, as the project was not operational in the sense of offering a public service with stipulated parameters.

**Copyright Limitations**

A number of would-be users of the URBANDOC system have raised the issue of copyright protection. The important point is that the copyright extends only to the content of publications; it does not affect the right of an information system to create bibliographic records referring to publications that are legally protected. However, the records for such works must not include abstracts that are part of the contents so protected.

It is perfectly permissible to enter into the system a bibliographic citation referring to an article in the *Journal of the American Institute of Planners* without permission from the institute so long as the published abstract is not also included. If an abstract is desired, the bibliographic facility can either seek permission to include the author-prepared abstract, or else prepare its own.

There are some cases in which not only abstracts but any part of the contents that seemed desirable could be included in the bibliographic record. This possibility exists for those documents which are not subject to copyright protection, a frequent situation with many government or government-funded documents.

It should be pointed out that the whole area of information systems is involved in a series of legal issues, some of which are not yet resolved by the courts.

**Currency Limitations**

The limited nature of the demonstration did not permit URBANDOC to build a document base that could adequately represent both current and retrospective materials. The URBANDOC decision was for currency.

During the period that the project was adding bibliographic records to its data base, publications would not ordinarily be eligible for representation in the *Input Index* unless they had been received within the calendar quarter.

A year would be the usual limitation for inclusion of materials in the searchable file. (Exceptions had to be made for non-United States materials which travel by boat, and for materials whose distribution was apparently delayed due to some governmental or private reason.) The implementation of this policy obviously meant that not all input would be processed in the same way; in fact, those records not routed through the *Input Index* were processed in separate cycles which avoided the publications module completely.

The *Index* was therefore truly a "current awareness" type of publication, one whose reputation would be built on its currency. This would also be true of the *Retrieval Report* used for selective dissemination of information, which URBANDOC envisioned as using the same data base as the *Input Index*. With both products, currency was not just an internal policy but a matter to be brought to the attention of users. The experimental *Retrieval Reports* produced for the 1969 American Society of Planning Officials conference provided a place for the description of the data base in terms of the receipt dates of the documents in the base.

Although the particular time frames developed by URBANDOC in its demonstration phase are obviously subject to adjustment, this additional kind of approach to the scope problem seems to be both workable and reasonable. Experience with potential users indicates that they react favorably to an explanation of the necessity of limiting the input to current materials. In addition, they seem to like the assurance that they can reasonably depend on one bibliographic service to furnish them with the first references to new materials within the rest of the scope coverage.

### Geographic Limitations

Geography as applied to subject was limited only in terms of the rest of the subject statement. If a particular urban problem or technique qualified for inclusion, it qualified regardless of whether the locale was in or out of the United States. The orientation of the document analysis, however, was in terms of applicability to the United States, because the document analysts used terminology that was oriented toward the goals of the Urban Renewal Demonstration Grant program. A more internationally oriented documentation effort would, of course, include a great many more non-American documents, and provide additional analytical focuses through enlarging the Thesaurus appropriately.

### Language Limitations

The scope must be defined by one additional dimension related to geography. As applied to the sources, the original understanding was that any sources qualified as long as the language of publication was English – whether originally or sumultaneously. Although most of the English-language sources were in fact American, the document base includes government documents and periodicals from the United Kingdom, Canada, and Australia. The multilingual sources are represented by the United Nations and the International Federation of Housing and Planning.

## Acquiring the Documents

URBANDOC did not purchase the materials for its document base, relying instead upon the cooperation of the agencies, organizations, and publishers in the field.

### Automatic Transmittal

Emphasis of the acquisitions effort in a document facility is more efficiently on the sources rather than the individual publications. The determination of terminology that was oriented toward the goals of the Urban Renewal Demonstration source candidates, and the review of their analytic and retrieval value at regular intervals, should be an important procedure in an attempt to implement a documentation effort. During the start-up period, the members of the Advisory Council who were executive directors of professional organizations were asked to suggest appropriate sources, with the emphasis on quality rather than mere existence. This procedure was not publicized lest there appear to be an endorsement of particular agencies or their work. In an ongoing operation, appropriate determinations of sources will be crucial.

URBANDOC's experience indicates that it is reasonable to expect automatic transmission of documents within certain frameworks. It is most realistic to expect compliance with HUD directives, especially when they have been in effect long enough for all the routines to be sufficiently established. The transmission of other materials depends in part on the degree to which an agency maintains mailing lists.

Other factors affecting automatic transmittal were connected with the expectation that listings in the *Input Index* would produce large volumes of requests to the issuing bodies for the documents themselves. Organizations interested in selling documents would benefit from the publicity, but to others it would be a burden. The answer in the latter case seems to be to guide users to other places for copies of the documents, such as the National Technical Information Service (formerly the Clearinghouse for Federal Scientific and Technical Information), the professional societies, or commercial services.

### Solicitation

To the municipal reference libraries, which specialize in state and local documents, acquisition is a particular chore. There is no registry of urban-related nonbook materials that is comparable to the announcements of new trade and university press books in *Publishers' Weekly*. The HUD Library's *Housing and Planning References* is one good vehicle for learning about new documents, and the acquisitions lists of other libraries are also helpful.

However, there must be constant vigilance for the appearance of new sources, a common occurrence in the urban field. This was not a serious problem for URBANDOC, since the project was neither operational nor committed to a specific kind of coverage for the duration of the demonstration. The staff did watch for mention of interesting new sources, and attempted to widen its circle of contributors, without asking for more materials than could be handled by the existing staff.

The project also found it necessary to renew requests to places that had already indicated their willingness to cooperate. Sometimes their automatic mailings did not include the particular kinds of documents that the project wanted to include in the system. In other instances, the responsibility for certain kinds of reports might shift to a new agency – such as in the case of the Model Cities Program – without the old mailing lists accompanying the shift. Whether it is a generalized solicitation to a new source, or a request of other materials depends in part on the degree to which an agency maintains urban information facility is never-ending.

It might seem easier for a project such as URBANDOC to publicize its quest for new materials, particularly in the professional journals. However, the staff wanted to avoid the embarrasment of receiving materials that could not be entered into the system, whether for reasons of irrelevance, poor quality, or just quantity. Even with the quiet solicitation of sources, a great many interesting and high-quality documents had to be excluded.

## Selection, or Inclusion

While the choice of documents starts with the selection and solicitation of the sources, the process of assembling the document base continues until the staff has had the opportunity to examine the publications themselves. The amount of selectivity that can be exercised at this point is somewhat circumscribed by the scope statement and the terms of the acquisitions arrangements. It seems obvious that the staff should be able to reject materials that are clearly unsuited to the system, such as newsletters, meeting announcements, and other brochures of limited immediate interest. There was no question about excluding such materials on the basis of URBANDOC economics.

A more serious problem concerns quality. There have been many queries as to how a bibliographic information system would exercise qualitative judgement in the construction of its document base. This is an activity which the present staff has been reluctant to explore, especially in view of divergences of opinion as to the merits of many works. URBANDOC feels it is better policy to include all documents received that fall within the scope statement, but to make any necessary distinctions by selecting different modes of treatment. The following three courses of action seem to cover the chief contingencies.

### Automatic Inclusion

In the case of those sources where a project has agreed to serve as a depository library for certain classes of documents, all major receipts with depository status should be added to the document base, and indexed as fully as is consistent with general policy. To decide otherwise might endanger the ability of the system to provide the proper access to the documents. In the case of the Urban Planning Assistance Program reports, which URBANDOC received as a depository library, the principle of automatic inclusion was indeed followed insofar as project resources permitted. No further selection process determined which reports were to be analyzed other than informal randomization. If, during the period that URBANDOC was actively adding to its documentation base, another documentation facility had been documenting the entire set of Urban Planning Assistance Program reports, then perhaps the choice would have been less random.

### Abbreviated Inclusion

The depth – or the amount – of analysis that is acorded any particular document is often a subtle way pf dealing with the problem of selection. A minimum of document analysis establishes the item as part of the document base. However, the fewer the descriptors and the fewer the added entries (see *General Manual*), the less likelihood that a marginal item will appear in subsequent products of the bibliographic system.

The document base is the same in item count whether the analysis has been extensive or brief. The latter treatment makes it possible to include documents whose existence should be recorded as part of a bibliographic control function, even though their retrieval for most subject-oriented purposes appears to be of negligible value. This kind of selection decision is, of course, most appropriate in a field that lacks other unified means of registering its publications.

### "Retrieval-only" Inclusion

URBANDOC frequently received documents which were not appropriate for listing in the *Input Index* because they taxed the scope statement, most frequently in terms of currency. This did not mean the document should not be represented in the over-all system, particularly if it appeared to offer a genuine contribution to the retrieval potential of the file. The solution was a routing system. Those bibliographic records which were considered appropriate for input to the *Input Index* were so noted on the input form. The others were noted "for retrieval only" and handled in a separate processing cycle that by-passed the publications module.

One unfortunate consequence was that under these circumstances the *Input Index* would not serve as an index to the complete file, only to a portion. This was not sufficient for the project staff, which needed hard-copy access to the entire file. There fore, each time a magnetic tape reel was closed, the publications programs were used to index the entire reel, not just the records used for the *Input Index*. The same procedure, or a variation of it is adaptable to a fully operational information system.

## Physical Access to the Documents

### On-Site

In some documentation facilities, a library existed before the developments in documentation, and therefore the retention of the documents is not an issue. This was not the case with URBANDOC, the stated mission being to demonstrate bibliographic services, rather than physical access to the documents. However, the staff felt from the outset that it would require long-term access to the materials apart from any outside uses, and therefore the creation of a library turned out to be a by-product of the system.

Although small, and lacking some reference books that would ordinarily be found in a facility serving on-site readers, the document collection had all the attributes of a library in the sense of being organized, indexed, and accessible through a variety of bibliographic means. In addition, there were professional librarians on hand, since all the document analysts held master's degrees in library science.

The news of such a facility could hardly be kept secret, and many people from both within and without the university asked for permission to consult the documents as well as the bibliographic tools. Permission was usually granted because the project staff found it helpful to have personal confrontations with potential users. The cost of providing services to occasional visitors was compensated for by the opportunity to obtain feedback.

### Reproductions

Not all the users want physical access to the original documents; many of them prefer reproductions for off-site use. Each time URBANDOC distributed an *Input Index*, it received requests for copies of the documents, and it was necessary to explain that this was not part of the project services. This confusion existed because a service that provides either full-size or microform reproductions is not only technically feasible, but within the scope of documentation services in other areas.

Although URBANDOC did not experiment with reproducing part of its data base, there was no reason why these services could not be added.

# PRODUCT DEVELOPMENT

Although the original project goals were stated in terms of products, the full concept of product development evolved later. Constant was the idea that a single data base should be capable of supporting all the various bibliographic services appropriate to an information system. The two main services, publications and retrieval, have already been discussed in terms of their relationship to the document analysis. However, their development as marketable products involves intellectual and practical considerations of broad applicability.

As the project progressed, it became evident that inherent in each of the products were several service potentials. Consumer needs, consumer tastes (not necessarily consistent with the needs), and production cost were among the considerations that would require careful attention in the course of preparation for the market place. The best possible *Input Index* from the point of view of documentation theory would not necessarily be the most appropriate one for the project to recommend for distribution to practitioners.

## Field Testing

The advantage of demonstration status was that both the product and the production environment could be developed simultaneously. There was no commitment to provide any kind of continuing services, much less one with fixed formats. Succeeding issues of the *Index* or special *Retrieval Reports* could display different possibilities to potential users. The label "field test" on all such product examples issued was intended to dispel any doubts in the mind of the recipient as to the status of the material on hand.

### Thesaurus

The first hard-copy product to be reproduced in quantity and distributed to potential users for comment was the *Thesaurus*. It was issued in May 1967 and reissued in August. The first three hundred copies were reproduced with the help of the New York City Planning Commission, and the second three hundred with the help of the Graduate Center of the City University. The recipients were members of the planning profession who had been known to URBANDOC since the original pilot project, plus a great many librarians and others active in urban planning and renewal.

As indicated in Chapter III, "Goals: Evolution and Resolution" the response resulted in many useful changes to the working copy of the Thesaurus. It also resulted in the Thesarus acquiring something of a reputation as a guide for specialized libraries, and the many subsequent requests for the Thesaurus had to be referred to the Clearinghouse for Federal Technical and Scientific Information, which made it available in both full-size hard copy and microfiche.

### Publications

The next instance of field testing was similarly informal. It consisted of distributing early versions of the *Input Index* to a mailing list of approximately eight hundred individuals and asking for informal feedback. The indexes were numbered 1 (December 1967) and 2 (January 1968) respectively. The first was based on 300 documents, and the second on 340 documents. In both cases the specialized listings included arrangements by personal authors, corporate authors, titles, subjects, and consultants.

The distribution list included directors of local housing and renewal agencies and municipal, county, and state planning agencies who had added the project to their own mailing lists for document distribution (see Chapter IV), plus recipients of the URBANDOC Thesaurus. The feedback on these issues, which had been produced very inexpensively, revealed the importance of aesthetics in bibliographic products.

The third field test in the spring of 1968 used more formal reproduction techniques and received wider distribution (four thousand copies). The American Institute of Planners made available its entire membership list for URBANDOC's use. A covering letter from the executive director of AIP introduced the test issues and encouraged response to a questionnaire that had been prepared by URBANDOC in consultation with the institute.

Several factors were being studied. One was a comparison of the two versions of the *Index*, one of which was a cumulation and rearrangement of the bibliographic citations in issues 1 and 2; the other presented new citations as well as alternative arrangements as issue 3.

About 10 percent of the recipients responded to the questionnaire – a small but acceptable figure. The nature of the responses indicated that URBANDOC would have to make further improvements in the *Input Index* before it could function effectively as an index journal for this audience.

The improvements were implemented – as far as practical – for issue 4. That was the last of the field tests for the *Input Index*: the issue was produced and distrubuted in January 1969. Some of them went to respondents of previous field tests, in order to obtain a continuing evaluation of both graphics and contents. Additional copies were sent to individuals who had learned of the earlier issues, particularly librarians and faculty members at colleges and universities. The questionnaire accompanying this field-test issue was partially comparative and partially new.

The response from issue 4 resulted in the prototype *Input Index* contained in Appendix B of this volume. In the following sections of this chapter, additional details are given about the resolution of the problems of aesthetics, reproduction techniques, and user response to the *Input Index*.

**Retrieval**

The last of the three major products to receive field-test treatment was the *Retrieval Report*. As previously indicated, machine retrievals had been produced in the course of development. Search statements were suggested by the staff and members of the National Advisory Council to test various responses of the computer programming. These were all "retrospective" searches in that the search was made of the entire file, however large it was at the moment. The term "retrieval" ordinarily refers to this kind of use of the system, although the retrieval capability can also be applied just to the current input, in which case the product is called some for of selected dissemination of information or SDI.

In the SDI variation of retrieval, each user has submitted a "profile," expressed in descriptor terminology, which constitutes a standing order or query. At regular intervals, the group of profiles is processed against the new input, the purpose of the product being to alert the user to incoming materials in his field(s) of interest. The individual profiles may be either general or specific, and may be adjusted from time to time. It is also feasible – and in fact economical – to have group profiles, each one serving several users with similar interests.

In view of the growing interest in SDI, URBANDOC decided to make its public field test of retrieval take that form rather than retrospective searching. The opportunity was provided by the 1969 annual meeting of the American Society of Planning Officials, which had invited the project to organize a formal session by way of a report to that segment of the urban profession. After examining a preliminary copy of the conference program, the staff formulated eighteen search statements, each one reflecting a particular aspect of the program, which were processed against a small file of current input.

A questionnaire enclosed with these *Retrieval Reports* solicited comments by ASPO members and visitors attending the session. The response was good, but it was not conclusive; the audience appeared to be more at ease with computer-produced information than might be expected of a more general audience.

## The Issues

### Aesthetics

Issues 1 and 2 of the *Index* were printed directly onto continuous-form multilith mats, which were used to reproduce the issues. While this was an inexpensive and convenient way of reproducing printouts, few users seemed willing to trade less formal appearances for the economies in production. Later issues were produced by reducing and photo offseting the print-out reports. Although many recipients reported on the difficulty of reading computer-produced indexes with substantial reductions in print size, the 18 percent reduction in *Index* No. 4 was found to be satisfactory.

Many of the adverse comments about the physical appearance of the earliest issues of the *Index* were solved by revisions of the computer programs. These included greater use of indentation to distinguish parts of the main document listing, making the location of page numbers for sections of the *Index* uniform, and the addition of running heads on each page. Use of colored paper in issue 4 to distinguish the major sections of the *Index* resulted in substantial user approval. Further refinements in the display of the record are made in the prototype. The cost of increasing the aesthetic appeal by these changes was substantial, but they represented one of the issues in determining the commercial viability of the product.

The URBANDOC solution to the aesthetics problems of the final hard copy is quite different in basic approach from those documentation centers that produce indexes that do not even look like printouts. In the URBANDOC publications module, the output is the printout itself. In more sophisticated (and expensive) systems, the output is magnetic tape, which goes through further computer processing before it emerges as traditional-looking type, complete with right-hand justification, upper-and lower-case letters, and different fonts. Although the URBANDOC product may seem simple by comparison, it is economically sounder for the projects most likely to be undertaken in any local or regional implementation.

In the case of retrieval, aesthetic considerations appear to be less important, but not negligible. Prior to the last quarter of 1969, URBANDOC used the standard report format that came with the Combined File Search System. Although somewhat difficult to read, the programming resources of the project could not support the extensive reprogramming that would have been required in order to produce a more readable product. The users did not complain; neither did they rush requests for more searches. To approach a wider audience seemed unwise until the situation could be remedied. This was done when URBANDOC found – and arranged to use – a set of programs called "Search Expansion" from the *Engineering Index*. They produce the format illustrated in the appended *Retrieval Report*. It is not only readable, but also easily handled by standard office copying equipment.

**Presentation**

There are difficulties in presenting bibliographic information in ways that are both economical and understandable to nonbibliographers. All the feedback indicates that readers prefer to have indexes arranged chiefly by subject and to have each citation as full as possible. Unfortunately, this becomes economically unfeasible since each book or article is cited many times in the typical index, appearing under several different subjects as well as in author and other specialized listings. (For a fuller discussion of the bibliographic records, see the *General Manual*).

Publication costs dictated a simpler solution, preferably one in which each bibliographic record would be presented in full only once. All other citations would use a number to refer the reader to the full citation. URBANDOC studied the field-test results to try to achieve a compromise between strict economics and complete user satisfaction. The Main Subject Listing in Appendix B reflects the compromise.

*Input Index (as Appended)*

The citations in this first section of the prototype *Index* are arranged by this subject heading, the latter in alphabetical sequence. The citations themselves contain only the primary author, the title, and the document number. If the reader is interested in such further bibliographic information as imprint, publisher, abstract, or other added entries, he must turn to the second section of the *Index*, the Main Document Listing. The arrangement is in document number sequence. (The document number itself is explained in detail in the *General Manual*.)

The third section of the *Input Index* contains the various specialized indexes: personal author, corporate author, title, project number, place, consultant. Those listings are even more economical than the Main Subject one, containing only the access point in alphabetical sequence and the document number. The specialized indexes are therefore completely dependent upon the Main Document Listing. This necessity to go from one listing to another for complete bibliographic information is called the "double look-up." It is a feature common to many indexes, for the same reason of economy.

*Retrieval Report (as Appended)*

In the *Retrieval Report*, each citation is listed once, in its entirety. There is no "double look-up" outside of the necessity to check the full name of periodical titles. Even these are quickly learned, especially the ones that are frequently retrieved. The only other "translation" problem in the citation concerns the geographic descriptors, since they appear as numeric codes rather than natural language place names. A few miscellaneous bits of geographic information (Standard Metropolitan Statistical Area and city size) would require consultation with external tables, but the main place names reappear later in the citation in natural language. In practice, the presence of coded information for the geographic part of the document analysis does not interfere with the readibility of the *Retrieval Report*.

A little more disconcerting is the fact that each citation starts with the descriptors and proceeds to the author, title, and other usual elements of bibliographic information. Although the reverse order seems more natural, there are advantages to a display format which shows the reasons for retrieving a particular document before the document itself is described bibliographically. In any case, URBANDOC had no option but to accept the present format for demonstration purposes.

If the retrieval capability were being used operationally for selective dissemination of information, the pressure to reformat the report would be greater. Many other systems produce their SDI reports on cards, one citation per card. The cards are designed for easy mailing as well as easy filing by the recipients. The necessary programs could easily interface with the Combined File Search, thus making the results of SDI searches in the URBANDOC system a different-looking product.

Another possiblity for using the retrieval capability consists of specialized bibliographies. URBANDOC developed its own retrieval-publications interface which enables the computer to search the data base retrospectively, produce output on a reel of magnetic tape, and then rearrange the output into the formats of the *Input Index*. URBANDOC assigned a tentative name to this product – *Subject Series* – but did not produce field-test issues.

### Optional Elements of Information

Whereas the issues on presentation are the results of decisions at the time of output, the issues in this section also become involved in the input. If all the needs of all potential users were accommodated, each record would contain funding information, abstracts, project numbers, ordering directions, and many other desiderata. The field test helped to indicate consumer reactions to these possible features.

The prototype *Input Index*, in addition to incorporating many minor improvements over the previous versions, added one completely new feature. In response to requests during the field test, the ordering information is included in the Main Document Listing. On the other hand, the prototype retains one feature that did not gain wide consumer acceptance: the project number index, restricted at the moment to projects under the Urban Planning Assistance Program. URBANDOC feels that this feature should not be discontinued without further exploration. Further testing can be done, since it is the least expensive of the optional features.

The most costly of the options is the abstract, which in many other documentation services is basic to the entire index. Although abstracting was not a primary URBANDOC responsibility, the project took advantage of the opportunity to include this kind of analysis when an abstract was provided with the Urban Planning Assistance Program reports. Since the field test indicates consumer acceptance, the project felt it worthwhile to experiment with the agency-provided abstracts. The results, much more compact than the originals, are included for many of references in the Main Document Listings in Appendix B.

### Mix of the Document Base

Composition of the document mix in a bibliographic system is also an issue. URBANDOC had envisioned the document base as being composed primarily of reports and periodical articles of a professional level. During the development of the computer system, some of the input to the document base was designated for retrieval only, since the items were believed to be of limited interest from the standpoint of a particular product, e.g., newsletters of a house organ nature.

Within the base considered for publication use, the document mix was maintained at roughly 5 percent monographs, 70 percent documents, and 25 percent periodical articles. The consequences of this policy were twofold. First, many recipients of the *Index*, as well as other people, were unaware that the listing in the *Index* issue was less than the total input. Second, the scope of the mix was frequently questioned by potential users, depending upon their special interests.

The project received suggestions to include several other types of materials, such as articles from popular and semipopular journals. Therefore, the first large field-test questionnaire contained questions eliciting possible interest for each type. The response was 52.7 percent for including materials from popular journals like *Newsweek*, and 65.3 percent for such semipopular ones as *Fortune*. This was a surprising result, since the bulk of the field test had been with members of the American Institute of Planners. Similarly unexpected interest was shown in the possibility of a book-review index: 56.7 percent responded favorably.

The potential effect of extending coverage to popular and semipopular journals on a continuing URBANDOC-type system is manifold, especially for the input economics. Such articles are easy to acquire and analyze. A substantial increase in that part of the data base would dramatically reduce over-all unit costs. However, these materials are already covered by many commercial indexes, and the essence of URBANDOC was to demonstrate automated bibliographic controls for the more difficult materials. Obviously many trade-offs will bear consideration before there can be a final decision as to the composition and mix of the data base.

## The Respondents

### Majority Practitioners

A good measure of user acceptability and interest in the *Input Index* as a product was supplied by the response to two questionnaires for the last two field-test issues. Of the 10 percent responses, approximately 70 percent were from practitioners, both planners working with public agencies and consultants. The remainder (30 percent) were from persons closely associated with planning and urban development, either as members of academic institutions, planning librarians, or as documentalists and others interested in library automation. During analysis of the questionnaires a further analysis of the practitioners' responses was made as to functional interests, e.g., those concerned with management and administration vis a vis those primarily concerned with research and analysis, including information systems.

### Influence of Functional Responsibilities

Significant variations in the needs and interest levels of the six categories of respondents emerged as the questionnaires were analyzed. Upon comparison, a pattern was discernible on almost every item covered in the two questionnaires. Planning agency management respondents were most interested in the *Input Index* as an information resource, but did not particularly see themselves using it as extensively as other members of their staff. Using the percentages as an indication of interest, the planning agency management group replies showed a consistently lower level of interest in many aspects of the *Index* mentioned in the questionnaires than did the other categories.

Conversely, the four other major planning information users – academia, planning agency research analysts, consultants, and librarians – expressed interest in the *Input Index* issues as a working tool. Their answers to questions regarding the scope and format of the indexes, the bibliographic policy and even methodology reflected interest in the potential usefulness of the *Index* as a reference and current awareness tool. The pattern of responses by planning librarians also indicated the constraints they have on their collections and their acquisition policies for types of materials.

While the questionnaire return summary tabulations show the rising level of satisfaction with the *Input Index* by all categories of respondents, some of the differences can best be pinpointed from detailed breakdowns.

### Resource Versus Reference User Attitudes

While 69.7 percent of the total respondents to questionnaire 1 (evaluating the cumulated index issue and *Index* No. 3) were satisfied with the preface and introductory materials, both planning agency management and planning consultants found the materials less satisfactory (66 percent for each category). The lower satisfaction of the management category continued at the same level (66 percent) in evaluating the introduction of *Index* No. 4. The consultant category, however, found improvement (90 percent satisfied). Both categories were less satisfied with the table of content presentation in *Input Index* No. 4 than the total respondents (75.8 percent, 80 percent, and 81.3 percent respectively).

In the first questionnaire, respondents were asked about their interest in several additional proposed indexes. The geographic index was one of the indexes added for *Index* No. 4. In the second questionnaire, respondents were asked if they found the geographic index included in *Index* No. 4 useful. A comparison of responses by categories to the two questions not only indicated that the five major categories found the index more useful than anticipated but reflects a typical measurement of usefulness for individual categories:

| Questionnaire #1 % of yes | Questionnaire #2 % of yes | Respondent Category |
|---|---|---|
| 68.8 | 92.0 | Academic |
| 68.4 | 81.0 | Planners – Research |
| 67.7 | 95.0 | Consultants |
| 63.9 | 72.5 | Planners – Management |
| 70.4 | 77.2 | Librarians |

### Survey Summary

Accurate profiles of the various user group needs certainly cannot be derived from the responses to such informal market research tools as the two questionnaires, but broad outlines and various areas of overlapping interests do become apparent. For the statistically oriented, the total return for each of the questionnaires was approximately 10 percent of the mailing; only usable returns were tabulated (less than 1 percent were not usable because of missing source identification or incompleteness). All quantification is expressed in percentages of the total usable returns. Both questionnaires used either "yes" and "no" or "satisfactory" and "unsatisfactory." Space for comments was provided. The analysis does not include comments; "satisfactory" was treated as a "yes" answer and "unsatisfactory" as a "no" answer.

*Summary of User Response to Questionaire Sent with Input Index 3 and Cumulative Edition of Index 1 and 2*

| | | **Total Respondent Replies by Percentages** | | |
|---|---|---|---|---|
| | *Question* | *Yes* | *No* | *No Answer* |
| | *Re:* **Input Index** *as a Whole* | | | |
| 1. | Format—satisfactory? | 78.5 | 16.1 | 5.4 |
| 2. | Contents—satisfactory? | 78.9 | 14.2 | 6.9 |
| 3. | Sequence of indexes—satisfactory? | 74.7 | 17.4 | 7.9 |
| 4. | Prefaces and Introduction—satisfactory? | 69.7 | 22.1 | 8.2 |
| | *Re: Document Listing* | | | |
| 5. | Is this listing comprehensible? | 83.3 | 12.3 | 4.4 |
| 6. | Do you prefer associated author information here? | 48.6 | 42.3 | 9.1 |
| 7. | Do you want federal project numbers in this main bibliographic entry? | 52.7 | 34.4 | 12.9 |
| | *Re: Special Indexes* | | | |
| 8. | Personal author—satisfactory? | 85.2 | 11.0 | 3.8 |
| 9. | Corporate names—satisfactory? | 79.8 | 12.9 | 7.3 |
| 10. | Subject—satisfactory? | 82.6 | 10.7 | 6.7 |
| 11. | Significant title—satisfactory? | 81.7 | 12.6 | 5.7 |
| 12. | Consultants—satisfactory? | 78.2 | 12.3 | 9.5 |
| | *Re: Subject Index* | | | |
| 13. | Are the subject headings adequate? | 81.0 | 11.7 | 7.3 |
| 14. | If you are familiar with the URBANDOC Thesaurus, would you use it as a supplemental tool for finding cross references? | 49.5 | 14.8 | 35.7 |
| | *Re: Proposed Additional Indexes* | | | |
| 15. | Geographic Index —interested in? | 66.2 | 24.6 | 9.2 |
| 16. | Book Review Index—interested in? | 56.8 | 27.5 | 12.7 |
| | *Re: Frequency of Issue* | | | |
| 17. | Every six weeks—satisfactory? | 64.0 | 18.0 | 18.0 |
| 18. | Cumulated bi—annually—satisfactory? | 74.1 | 18.3 | 7.6 |
| | *Re:* **Input Index** 3 only | | | |
| 19. | Do you like the title and subject combination? | 68.8 | 24.6 | 6.6 |
| 20. | Do you like the corporate author and consultant combination? | 67.8 | 22.1 | 10.1 |
| 21. | Do you find it possible to cope with the truncated titles and corporate names? [The combination indexes gave citations by document numbers only.] | 72.9 | 20.5 | 6.6 |
| | *Re: Layout and Print Size* | | | |
| 22. | Print size for Issue No. 3—satisfactory? | 70.3 | 23.7 | 6.0 |
| 23. | Print size and format for Cumulative Issue? | 79.4 | 13.4 | 7.2 |
| 24. | Are these types of formats easy to use? [Index 3 was bound across the top.] | 73.5 | 17.0 | 9.5 |

*Summary of User Response to Questionnaire Sent with Input Index 3 and Cumulative Edition of Index 1 and 2*

(continued)

| | | **Total Respondent Replies by Percentages** | | |
|---|---|---|---|---|
| | *Question* | *Yes* | *No* | *No Answer* |
| | *Re: Ordering Information* | | | |
| 25. | Can you obtain most documents analyzed within your agency or from others in your area? | 54.6 | 29.6 | 15.8 |
| | *Re: Scope* | | | |
| 26. | Would you like the **Input Index** to include pertinent articles from popular journals, e.g., **Newsweek**? | 52.7 | 39.4 | 7.9 |
| 27. | Semipopular journals, e.g. **Fortune**? | 65.3 | 24.9 | 9.8 |
| 28. | More foreign documents? | 46.7 | 43.8 | 9.5 |
| 29. | Greater attention to graphic materials? | 48.0 | 37.5 | 14.5 |
| | *Re: Browsing Procedures* | | | |
| 30. | Do you browse by author first? | 32.5 | 63.1 | 4.4 |
| | (a) % of "*Yes*" cited corporate author | (58.2) | | |
| | (b) % of "*Yes*" cited personal author | (24.2) | | 17.5 |
| 31. | Of all indexes, which do you use first? | | | |
| | (a) % cited subject index | 63.1 | | |
| | (b) % cited significant title | 9.1 | | 27.5 |
| 32. | Of all indexes, which do you use second? | | | |
| | (a) cited an author index | 18.3 | | |
| | (b) cited subject index | 5.4 | | 43.9 |
| | (c) cited significant title | 20.2 | | |
| 33. | If we add an abbreviated Document Listing, sorted by broad subject headings, what headings would you use–give 5-8 examples? | 37.5 | | 62.5 |
| | [Because this was a fill-in question, tabulation was made of those responding as follows:] | | | |
| | (a) subject examples | (87.4) | | |
| | (b) political jurisdiction examples | (12.6) | | |

*Summary of User Response to Questionnaire*
*Sent with Input Index 4*

| | | Total Respondent Replies by Percentages | | |
|---|---|---|---|---|
| | *Question* | *Yes* | *No* | *No Answer* |
| | *Re: General Performance* | | | |
| 1. | Is the *Input Index* a reasonably satisfactory prototype of a computer-generated indexing tool? | 91.8 | 4.6 | 4.6 |
| 2. | Do the listings in *Input Index* 4 represent the kinds of indexes and materials you would like to see and can use? | 87.2 | 8.2 | 4.6 |
| | *Re: Format and Arrangement* | | | |
| 3. | Introduction—satisfactory? | 80.2 | 13.0 | 6.8 |
| 4. | Table of Contents—satisfactory? | 81.3 | 13.0 | 5.7 |
| 5. | Sequence of sections and subsets—satisfactory? | 86.1 | 8.2 | 5.7 |
| 6. | Page headings and color paper—satisfactory? | 87.2 | 8.2 | 4.6 |
| | *Re: Major Subject-Index* | | | |
| 7. | Can you tolerate the abbreviated bibliographic form (author, title), in this particular listing as an economic compromise between full information and mere reference to a document number as in previous issues? | 86.1 | 8.2 | 5.7 |
| 8. | Do the subject headings (left column) in this listing reflect present and/or anticipated information needs adequately? | 73.3 | 15.1 | 11.6 |
| 9. | Would you be interested in participating in retrieval tests using the more complete subject analysis which is in the computer system? | 65.2 | 25.5 | 9.3 |
| | *Re: Document Listing* | | | |
| 10. | Can you tolerate the omission of associated authors and project names in this listing [this was suggested by respondents to previous questionnaires]? | 81.4 | 12.7 | 6.9 |
| 11. | Do you like the inclusion of abstracts with the documents that are associated with the Urban Planning Assistance Reports (701)? | 72.1 | 13.9 | 15.0 |
| 12. | Is the arrangement of document records into these subsets with page titles useful? | 74.0 | 11.0 | 15.0 |
| | *Re: Special Indexes* | | | |
| 13. | Urban Planning Assistance Program Projects—useful? | 72.0 | 11.0 | 17.0 |
| 14. | Geographic (place names in document)—useful? | 79.1 | 8.2 | 12.7 |
| 15. | Statutory Citations—useful? | 67.2 | 11.0 | 20.8 |
| | *Re: Future Possible Services* | | | |
| 16. | Would you be interested in having a subscription service offer the option of copies of the documents themselves on suitable microform at nominal additional costs? [This would apply only to materials that are not subject to copyright.] | 65.1 | 25.5 | 9.4 |

*Summary of User Response to Questionnaire*
*Sent with Input Index 4*

| (continued) | **Total Respondent Replies by Percentages** | | |
|---|---|---|---|
| *Question* | *Yes* | *No* | *No Answer* |
| 17. Would you be interested in having a subscription service include news about the operation of the URBANDOC information system and suggestions for local implementation? | 65.0 | 24.0 | 11.0 |
| 18. Would you be interested in a subscription service that included listings of actual computer systems and programs in urban information that may be available? | 69.4 | 22.0 | 48.6 |
| 19. A number of U.S. radio and television stations produce programs relating to city planning and urban development activities in the areas they serve. Would you be interested in having bibliographic information on such programs included in the **Input Index**? | 59.3 | 28.4 | 12.3 |

# DATA PROCESSING

Although the use of computers was at all times a central element in Project URBANDOC, the focus was on the application of existing techniques rather than on the development of new ones. Chapter III indicates the relationship between the computer programs and the attainment of the original project goals.

A great deal, of course, remains to be said about the machine processes by which the analysis of the document base became a functioning data base. Some of the discussion relates to technical topics and some to administrative issues. The former has, with the advice and consent of HUD, been largely reserved for the *General Manual* and the *Operations Manual*. However, a general description of the programming system is appropriate for several reasons. First, few "generalists" can escape a data-processing environment so engulfing that machine model numbers are entering the vernacular; and second, the introductory remarks about the system are essential background to a consideration of the administrative issues that are properly part of this report.

## Introduction

### The Programs

The total system is a composite of programs from several sources. The core of the system is the Combined File Search System from the IBM 1401 Program Library. The majority of the remaining programs and subsystems were completely developed and implemented by the URBANDOC staff. There is also the set of programs obtained from the *Engineering Index*. The basic programming languages are AUTOCODER and COBOL.

For systems development purposes there are five modules, or groupings of programs, that perform the various processing operations. The Thesaurus Module maintains the Thesaurus, both in machine-readable and hard-copy form. The Pre-edit Module formats the input data and edits and lists it for proofreading and correction by the document analysts. The Search Module performs the computer search and prints the *Retrieval Report.* The Publications Module maintains the files for the index journal and prints as the *Input Index*. The Pre-edit Module and the Publications Module were wholly developed by URBANDOC. The other modules consist of programs from the various sources. When considering the system for operations purposes, there are also processing cycles, or a different regrouping of the programs.

### The Equipment

After the analysis of a document was completed, the worksheets were used to create machine-readable input. For the most part, URBANDOC used a keypunch on the project's premises to create punched-card files. The card files were then transported to the Computer Center of Baruch College for the actual machine processing.

The system used in the URBANDOC demonstration was implemented on the IBM 1401 computer. URBANDOC used the full capacity of the Baruch College installation, which has twelve thousand positions of memory, card reader, card punch, printer, four tape drives and two disk drives. (Actually, this system could be run on an IBM 1401 with eight thousand positions of memory, card reader, card punch, printer, and four tape drives.)

The project's own systems staff operated the computer. The files were maintained on magnetic tapes and the programs on punched cards. Both the data files and the program files were stored and maintained at the Computer Center. The printed results of processing – both preliminary listings and the final products – were transported back to the project premises.

In the absence of equipment for setting type, the printouts for the *Input Index* were photo-reduced for final reproduction by offset reproducing equipment. Both Graduate Center and commercial facilities were used for these post-computer processes.

## Problem Areas

A study of URBANDOC could evaluate each activity as a success or a failure. The project feels it would be meaningful, however, to consider problem areas (instead of failures) since these are bound to recur in future documentation efforts in the urban areas.

If the problem areas are identified with the activities that give rise to them, then they can be divided into four broad categories: pre-document analysis, document analysis, data processing, and product development. The first category has already been discussed in Chapter IV, "The Document Base," and the second in Chapter III, "Goals." The third category, data processing comprises the present chapter. Other problem areas emerged in Chapter V, "Product Development."

When discussing difficulties in data processing, the differentiation must be made between systems considerations and administrative considerations. As pointed out earlier, the emphasis here is administrative. The following topics, while not common to all documentation efforts, are characteristic of those using data processing.

### Data Entry

The first problem area is data entry, or the creation of the information in a form directly usable by the computer. Computers cannot yet, either economically or technically, directly accept through optical scanning techniques the text of large volumes of written or printed matter. The bibliographic records created by the document analysts must therefore be converted into some kind of machine-readable form, either by keypunching or by some other device.

Keypunching is the most widely used method. However, the logistics involved in transporting large volumes of cards to and from off-site computer facilities created something of a problem. In an attempt to alleviate it, URBANDOC investigated devices that would enable the document analysis to be encoded directly onto magnetic tape, eliminating the creation of large card files. DATATEXT, the system that appeared to be the solution, was a version of IBM's Administrative Terminal System, available on a commercial basis. URBANDOC tested DATATEXT for almost a year.

The equipment consisted of a typewriter-like terminal. It was installed at the project's office and was connected by telephone to an IBM 1460 computer dedicated to certain record creation and correction functions. The keying operations were performed by a typist who had received several days of specialized training on the terminal. The typist operated a keyboard and sent the bibliographic input records over a telephone wire to an IBM 1460 computer. The input was then written onto a magnetic tape which would be used to update the URBANDOC file. These tapes, machine-readable input for future processing, could be produced by the commercial service on short notice and delivered to the project offices for redelivery to the Baruch College computer facility. They would be substitutes for punched-card input to the URBANDOC system. Or so it seemed.

Unfortunately, many problems arose from the intervention of the additional off-site facilities. For both administrative and economical reasons, the project returned to keypunching for all data entry, at least for second-generation computers (the 1400 series). Future documentation efforts will undoubtedly reopen the entire issue. Whether using computers in the same building or elsewhere, they are most likely to resort to some kind of terminal, possibly one not in existence at the time URBANDOC was investigating alternative data entry devices. Even now, the project feels that procedures such as those discussed in Chapter VIII, "Conclusions and Caveats" might have yielded greater success.

Data entry problems are not restricted to those involved in making the proper choice of mechanical devices. It is most important that no part of the entire operation be unnecessarily repetitious, which can be the case with data entry. Such a situation arises when the document analysts complete a worksheet and pass it on to the keypunch operator or terminal operator. Although the initial creation of the worksheet is not data entry as defined by data-processing terminology, it is in fact initiating the input. If all or part of documentation analysis can be done originally in machine-readable form (called source data entry), then economics would seem obvious. During the DATATEXT trial, the typist was also trained for simple descriptive analysis, the kind performed on periodical articles. The amount of repetition was therefore limited to the content analysis, which was performed first by the professionals. This part of the experiment was quite successful and could well have been extended to more complicated materials.

Although theoretically the same approach to data entry could be implemented on the keypunch, the nature of the URBANDOC materials militates against it. The descriptive analysis of the major documents is so difficult that the original entry must create hard copy that can be immediately reviewed. With DATATEXT and with some forms of terminals, the operator creates such hard copy when she types. With the keypunch and other terminals, this is not necessarily the case. There may be no readable record of the entries for some time. Revising and correcting can then be so difficult as to override the advantages of the single entry of data.

### Editing and Validating

Data entry is only the first step in transferring a batch of bibliographic records into a useful data base. After that there is a great deal of computer processing, some of which will disclose entries that require revision. Some of these represent keypunching errors – misspellings, omissions, etc. – while others are more in the nature of editorial decisions. Developing an effective method of handling these revisions can be a problem area.

At the start it seemed natural to check for errors at every point along the way and to make the changes as soon as the error became apparent. As a result, there were too many points at which proofreading, corrections, and data re-entry occurred – all expensive and somewhat chaotic. Correcting this situation required combining many human and machine capabilities. The details of the solution are presented in the manuals under "Editing and Validations."

The principles of the solution are of more general interest. All computer operations should be performed prior to error detection and correction. That way, all of the errors can be corrected at the same time, both those discovered by human editing and those found by computer validation procedures. One massive correction cycle can handle the entire problem.

A second basic principle is that access to the document master file must be carefully regulated. Unilateral decisions by individual members to revise a record already on the file can have unforeseen consequences. This will be even more important when there are several terminals on line to the computer.

### Systems Support

Adequate systems support, fundamental to every computer-aided operation, frequently becomes a problem area. What seems to be adequate support in the beginning turns out to be less so, experience turning up the necessity for expansion and modification of the system. For URBANDOC, additional support was inevitable. The original project design envisioned the acquisition of an already developed computer system requiring little in the way of further development or modification. Preliminary investigations, made at the time the demonstration proposal was being developed, had indicated that the Combined File Search (CFS) met these specifications.

The basic system was contributed to the IBM Program Library by the Service Bureau Corporation. It was not an IBM-supported set of programs. Experience revealed that considerable additional systems design and programming would be necessary, a requirement taxing to a project whose initial systems resources were limited to one person. Various devices, such as a cooperative arrangement with other users of the same system, overcame this deficiency. However, these same arrangements are not recommended as a guide for other documentations efforts in the field.

The second-generation systems experience of URBANDOC does not, however, indicate that conversion to the third generation need be an all-out expensive operation in terms of systems development. Three general possibilities are open to the user. Firstly, the use of a programming language oriented toward machine independence makes the conversion process a considerably simpler affair. For example, some of the URBANDOC programs are written in COBOL. Secondly, the existence of machine emulators and compatibility devices (such as those existing for the IBM 360) would allow the operation of the existing second-generation system on third-generation equipment. Thirdly, the idea of using a programming system from a manufacturer's programming library is still valid with the proper systems support. Some manufacturers provide support for a system that they have developed. Other manufacturers distribute contributed systems (those developed by others). In some cases, technical support must be provided by the individual installation. In other cases, technical support may be leased either from the manufacturer or from a consulting firm.

**Programming Languages**

In order to understand the problem arising from a choice of programming language, it is helpful to review the nature of programming languages themselves.

A programming language is a system designed to translate the instructions that a programmer writes into a machine language that a computer interprets and executes. Among programming languages, there are various levels of translators. Those very close to machine language are called assemblers. Generally, one programmer's statement becomes one machine instruction. Higher-level languages, compilers, convert one programmer statement into multiple machine instruction or perhaps an entire sequence of operations.

When selecting a programming language, the trade-offs between assemblers and compilers must be considered. In general, it is easier and faster to train a programmer in a compiler than in an assembler. Compilers are comparatively machine-independent; that is, a program written in a compiler can be transferred to another computer with little modification to the programmer's coding. However, compilers are usually less efficient in terms of the core storage required to store the program and in the processing time required to run the program.

The programs in the Combined File Search System were written in AUTOCODER, an assembler language oriented specifically toward the IBM 1401 computer. When URBANDOC enlarged the basic system to include publications and other capabilities, it seemed logical to continue writing in the same programming language. This policy did have drawbacks. First, since the language is specifically oriented to ward a particular piece of equipment, the resulting programs are not easily transferrable to other computers, let alone other manufacturers'. This became more serious when the government adopted the position that its computer work should be manufacturer-independent. Second, programmers for second-generation equipment were oriented toward writing in assembler-type languages. Programmers who enter the field after the advent of the IBM 360 and other third-generation equipment are not extensively trained to write in these languages. URBANDOC discovered this while enlarging the systems staff and had a choice of in-service training in AUTOCODER or shifting to another programming language.

Both these problems were resolved by programming in a compiler called COBOL. This move also had the advantage of facilitating any conversion from second-to third-generation computing. Once the programs were written in 1401 COBOL, they could, with necessary precautions, be easily converted for another system. However, there were disadvantages in operating in a COBOL environment. The time required to execute a job with a program in COBOL will be approximately double the time required by a comparable AUTOCODER program. Although this condition will still hold for the 360, it is anticipated that the faster speeds of the third-generation computer will make the greater execution time less onerous.

**Equipment Independence**

During the first year and a half the project used a computing facility outside the university. When Baruch College acquired the necessary equipment, URBANDOC transferred its computer operations to that installation and the data was designed for the most common 1401 configuration: four tape drives, eight thousand positions of memory, card reader, card punch, and printer. It fitted well within the configuration of the Baruch College installation, which contained additional features later utilized to expand the system. Had it been necessary to effect another transfer, the only problem might have been to cut back on some of the expansions.

The same situation is not expected for newer equipment. Third-generation computers require operating systems that control the operation of individual working computer programs for each individual installation. The typical computer manufacturer-provided operating system now requires more computer memory (and all that goes with it) than their more primitive second-generation predecessors. In addition there are more alternatives in selecting the input-output devices for each installation. As a result, there will be fewer computer installations with the exact configuration of equipment to run one particular set of programs.

The set of programs to perform such jobs as payroll, accounts receivable or information retrieval are called "processor programs" because they perform the actual manipulation of the data. On second-generation equipment like the 1401, the user needed only the processor programs. He could load his programs into the computer memory and run his job. On third-generation systems like the 360, there must be an intervening level of programs between the computer and the processor program. These programs, called "operating systems," are control programs that monitor the actual running of the processor programs. The operating system loads the programs into computer memory, provides for steady transition from one job to the next, controls input and output operations, records computer time used by each job. etc.

To compound the equipment independence issue, the individual installation will have a choice of several operating systems to use in its own facility. Besides locating the correct configuration, the user will have to find one with the correct operating systems environment.

Of less significance but worth mentioning is the secondary storage used for data files. The second-generation system stored its files on magnetic tapes (the most easily transportable of all media). Third-generation equipment uses direct-access storage ("disk," "drums," or "data-cell" devices), which are less amenable to such an arrangement.

The entire third-generation environment points to a situation where an URBANDOC-type project would be dependent on one computer for its main processing. A smaller auxiliary configuration could be used for certain peripheral operations, such as card-to-tape and report-printing functions. The amount of access and storage as well as the testing conditions will all require careful consideration.

## Production Schedules

The gap between experimentation and operations can be substantial, particularly if it involves data processing. URBANDOC's early experience indicated that complete success as a demonstration had to include the attainment of a production-oriented environment. It would not be sufficient to accomplish only the specified tasks or produce sample products. Some of the rigors of a production schedule had to be experienced for a report on the demonstration project to be useful to an ongoing operation.

Field-testing several issues of the *Input Index* satisfied the requirement for production experience. Several individual cycles of activities were geared toward producing an *Index* within a fixed time frame. Although the data bases were smaller than operational ones would be, the project did establish schedules for various activities and meet deadlines. The staff felt, by the time *Input Index* No. 4 had been distributed, that it could be published on a six-week cycle. This would include lead time for unexpected problems.

These findings depended upon the correct determination of the necessary lead times for the various operations, somewhat longer because of off-site computing. Scheduling also had to include thesaurus updating, document master file updating, retrieval, and testing of new programs. More computer time or fewer activities not directly related to the *Index* would, of course shorten the publication cycle.

The staff hoped that the production environment would expand to include machine searching on a regularly scheduled basis. The greatest challenge to the establishment of practical schedules appeared to be the introduction of search runs into the processing cycle, since several kinds of search services could be offered.

If selective dissemination of information was developed, the searches on user profiles would be run midway between the first processing of a new batch of input and the processing of revisions to that input. Such a schedule would guarantee a quick report. Unfortunately, it would be a somewhat "dirty" report, being based on uncorrected data. The idea was to have a product several weeks ahead of a regular *Input Index* issue. Errors might be acceptable in the SDI reports if the user knew that corrections would be made before the data appeared in more permanent form.

If retrospective searching services were also added, then processing scheduling becomes even more complicated. The processing of retrospective search requests, made against the document master file of records, are separate from the processing of SDI user profiles, since different data bases are used. The former generally involve the entire bibliographic file while the SDI search involves only the newest input. Decisions would have to be made whether retrospective searches on demand could be accepted from outside users at any time or at some stated intervals.

## MANAGEMENT AND PRODUCTION

### Reporting Requirements

The original URBANDOC specification of a cost-analysis section to the final report did not distinguish between the costs of a development effort and those of an ongoing operation. This refinement was added as a result of the Advisory Council meeting of January 29, 1969. Along with it was added a request – formalized in a letter from HUD to the project on February 21, 1969 – for an "Operational Data Analysis Package." The two were combined in one report, and submitted to HUD in March. This chapter summarizes the URBANDOC findings of spring, 1969.

#### URBANDOC as an Operational Model

In retrospect, it appears that the work program might well have provided for a postdevelopmental period in which a full staff would have prime responsibility for simulating production. In lieu of that, it was necessary to isolate certain parts of the URBANDOC experience, define the limitations, and consider them part of an operational model. Such an isolation has been accomplished mainly in terms of a five-month period from October 1, 1968, to February 28, 1969. Both HUD and the project staff considered this period reasonably indicative of postdevelopmental conditions, more in terms of document analysis than in terms of systems. (The preparations for converting from second-to third-generation computing equipment constituted the chief disruption of the systems stability.)

From an activities point of view, URBANDOC was performing all the functions of a bibliographic information facility; it was acquiring documents, analyzing them, constructing a machine-readable data base, and utilizing that data base to produce information services. The levels of activity were proportionately lower at both ends of the spectrum – acquisitions and services – than in analysis and processing. Neither materials nor queries were being actively solicited during the five-month period. The assumption was that in an operational situation neither solicitation would be necessary.

The document-analysis staff during the "model" period was represented by one experienced senior analyst, one analyst with some experience, and one new analyst added at the start of the model period. Total analysis capabilities were diminished when the project director spent the last six weeks of the period preparing a special report for HUD. As a result, she was largely unavailable for her usual participation in document analysis and review.

#### Input and Output

On the input side, URBANDOC as a model was deficient in terms of actual numbers of items handled per year. During the five-month period, 1971 documents were considered for inclusion in the system, and 1746 of them actually analyzed. This becomes an annual figure of 4000 bibliographic records, fewer than would be expected of an operational system. The project felt that it had enough information to project conditions for 8000 or even 10,000 items, but that larger projections might be unreliable.

On the output side, the URBANDOC five-month numbers are less indicative. *Input Index* No. 4 was the chief product of the period. The *Retrieval Report* was not ready until January and the *Subject Series* not until after the expiration of the so-called model period. Fourteen machine searches were performed in January-February. The individual retrievals varied in length from two to 220 citations. The results appeared to be satisfactory to the URBANDOC staff as well as to the recipients.

In general, output units are much more independent of staff activity than are input units. It takes little additional professional effort to run many more searches and to print more copies of an *Index*. If a documentation facility must be concerned with increasing the number of output units, promotional activities appear to be in order. The kind of output units to give such promotion stimulus will relate to the cost analysis. Further considerations are postponed until that section of this report.

## Operational Data Analysis

In early 1969, URBANDOC devoted much of its attention to analyzing the operational data and the cost data produced by the five-month period of simulating production. As indicated in the previous section, the actual input and output numbers of that period may require some revision in order to be truly indicative of production. The methodology developed for analyzing them, however, should prove durable.

### Methodology

URBANDOC developed, in consultation with HUD, an analytical approach that involved examining the entire operations in terms of individual, definable activities. In each case, this includes a process and a product. The product is not necessarily a consumer service, but a result from a process that, in turn, becomes the input to another process, until finally consumer services are realized.

Each activity was assigned a unique schedule number as identification for discussions of operational and cost data. The schedules distinguish between production-oriented and developmental activities, thus providing the basis for a documentation model that can be adjusted for a particular mix of developmental and operational responsibilities. Each schedule can also be considered as representing one variable in cost analysis.

URBANDOC was unique in that it was self-contained, performing all of its own processing (other than actual photo-reproduction). However, the cost analysis methodology anticipated a situation in which this might not be the case. Use of in-house and external organization capabilities are designated in the worksheet descriptions of each activity in the schedule.

The Process/Product Schedules list and a sample worksheet are presented in the following pages.

## List of Process/Product Schedules

| Number | Process/Product |
|---|---|
| 010 | Acquisition |
| 020 | Selection |
| 031 | Indexing |
| 032 | Documentation development |
| 040 | Thesaurus and other authority functions |
| 051 | Data entry: documents |
| 052 | Data entry: Thesaurus |
| 053 | Data entry: re-entry |
| 061 | Thesaurus processing |
| 062 | Editing and validation (EDP): documents |
| 070 | Editign and validation: human |
| 080 | Document storage |
| 100 | Input processing |
| 111 | **Input Index**: process to camera-ready copy |
| 112 | **Input Index** No. 4 (product development) |
| 120 (121-124) | Publications printing and dissemination |
| 131 | Retrieval: processing and file maintenance |
| 132 and 140 | Retrieval: product development |
| 150 | Documentation services (other than publication and retrieval) |
| 150 (Part II) | Feedback |

**Sample Operational Data Worksheet**

*Schedule No.* 051 *Process/Products:* Data entry: documents

1. *Process Description*: Keyboarding from document input worksheets

2. *Physical Inputs to this process (e.g. hard copy documents, bibliographic records, computer programs, etc.)*

   *Provided by URBANDOC*: 1746 worksheets (product of Schedule 031)
   *Provided by external organization (s)*: 0

3. *Human, non-computer processing services to this process (e.g. editing, validating, typing, management, etc.)*

   *Provided by URBANDOC*: KP, 5/12 of 6.60 annual man-months
   *Provided by external organization (s)*: 0

4. *Data processing services to this process (e.g. data entry, machine operations, machine time, etc')*

   *Provided by URBANDOC*: 55% of KP usage machine time
   *Provided by external organization (s)*: 0

5. *Product Description*: Bibliographic information in machine-readable form, ready for computer processing.

6. *Product Itemization:* 1764 decklets representing about 28,000 units of information

7. *Product Utilization:* To Schedule 062, Editing and Verification (EDP): Documents.

8. *Product Storage:* Temporary storage until successful completion of all EDP.

**Manning Data – General**

All the figures in the operational data analysis were based on the experience of the model five-month period. The term totals are actual counts. The manning data are also based on actual five-month figures – expressed in 5/12 man-years. This was to provide HUD with manning data that could be compared with that of other federal documentation efforts.

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Manning data legend:

PH=Project Director; DA=Document Analysts; OS=Office Services Personnel; SP=Systems and Computer Production Personnel; KP=Keypunch Personnel.

The amount of staff time spent on each individual activity was carefully calculated as part of the cost analysis. To the schedules for Process/Products were added five additional ones in a 300 series to cover General Administration, Advance Planning, Systems Development and Language Conversion, Computer Operations, and Office Services. The following schedule gives the percentages of staff time, and the actual man-years devoted to each of the activities.

**Manning Data by Function**

| Activity | Product/Process Schedule | % of Time | Man-Years |
|---|---|---|---|
| Acquisition | 010 | 1.9 | .18 |
| Selection | 020 | .3 | .03 |
| (Indexing | 030 | (24.6 | 2.36)* |
| Indexing | 031 | 22.5 | 2.16 |
| Documentation development | 032 | 2.1 | .20 |
| Thesaurus and other authority functions | 040 | 3.4 | .33 |
| (Data Entry – keyboarding | 050 | ( 7.1 | .68* |
| Documents | 051 | 5.7 | .55 |
| Thesaurus and other authority functions | 052 | .8 | .08 |
| Re-entry | 053 | .5 | .05 |
| (Editing and Validation–EDP processing | 060 | ( 2.7 | .26* |
| Thesaurus | 061 | .5 | .05 |
| Documents | 062 | 2.2 | .21 |
| Editing and validation–human | 070 | 4.0 | .38 |
| Document storage | 080 | 3.1 | .30 |
| Input processing | 100 | .5 | .05 |
| (Input Index | 110 | ( 1.0 | .10)* |
| Processing to camera-ready copy | 111 | .5 | .05 |
| Development through camera-ready copy | 112 | .5 | .05 |
| (Publications dissemination | 120 | ( 6.1 | .58)* |
| General administration | 122 | 4.2 | .40 |
| Data entry of mailing list | 123 | 1.6 | .15 |
| Mailing list processing | 124 | .3 | .03 |
| (Retrieval Report | 130 | ( 1.0 | .10* |
| Processing and file maintenance | 131 | .5 | .05 |
| Product development | 132 | .5 | .05 |
| Document services (other) and feedback | 150 | 5.0 | .48 |
| General administration | 300 | 4.3 | .41 |
| Advance planning | 310 | 3.5 | .34 |
| Systems development and language conversion | 320 | 18.3 | 1.76 |
| (Computer operations | 330 | ( 6.5 | .62)* |
| Management | 331 | 2.7 | .26 |
| Maintenance | 332 | 3.7 | .36 |
| Office services | 340 | 6.7 | .64 |
|  |  | 100.0 | 9.60 |

*Indicates summary figures by group.

## Cost Analysis

### General Considerations

The five-month experience during the model period also furnished the basis for analyzing the costs involved in operating a documentation facility. The five-month figures were projected for a year. In a few instances, figures were modified to eliminate strictly demonstration-status elements from the financial picture. All expenses include the value of noncash local contributions.

Since URBANDOC was a self-contained project (not attached to an urban renewal library or research effort), there was no option for using an incremental cost approach. If another documentation effort had such institutional arrangements, it might be possible to arrive at a more advantageous cost by considering only the incremental items in the budget. While many figures in the URBANDOC analysis would be appropriate for inclusion there, others would be absorbed in the overhead.

Many other considerations also affect the cost:

1. The amount of development work necessary;

2. The mix of the document base, there being a wide divergence in cost between handling major governmental reports and periodical articles, fairly standard Urban Planning Assistance Reports, and unique materials;

3. The amount and kind of analysis per document.

The figures in this report represent intensive effort in all three areas. The developmental work would undoubtedly be less in an operational situation. Other variables might be lowered as a result of a trade-off between operating costs and product packaging.

### Annual Budget

The total budget for the model period can be considered as 5/12 of $190,000. In the following discussion, all figures are annual, applicable to four thousand documents of input plus the output already discussed. Three major cost analyses were made: input and output costs; operational and developmental costs; and direct and indirect costs.

Major attention was devoted to the salary and wage items, which totaled $95,000 for the year. This figure included a staff of ten. The full-time staff consisted of a project director, three document analysts, two programmer-systems analysts, and two secretaries. The senior systems analyst was two-thirds time for the year; the key punch operator was half time. No other salary costs were involved since the accounting services were part of overhead and the computer operations were all performed by the URBANDOC staff. Messenger services to and from the computer center were also included in the overhead.

The three nonsalary parts of the budget were as follows:

1. Equipment costs: data entry devices; computer services; office equipment. (All computer time was assigned a cash value.)
2. Salary-and wage-related costs: fringe benefits, overhead (includes shelter and various administrative expenses).
3. Miscellaneous costs: travel; Advisory Council, communications, printing (for field-test issues), supplies, contingencies.

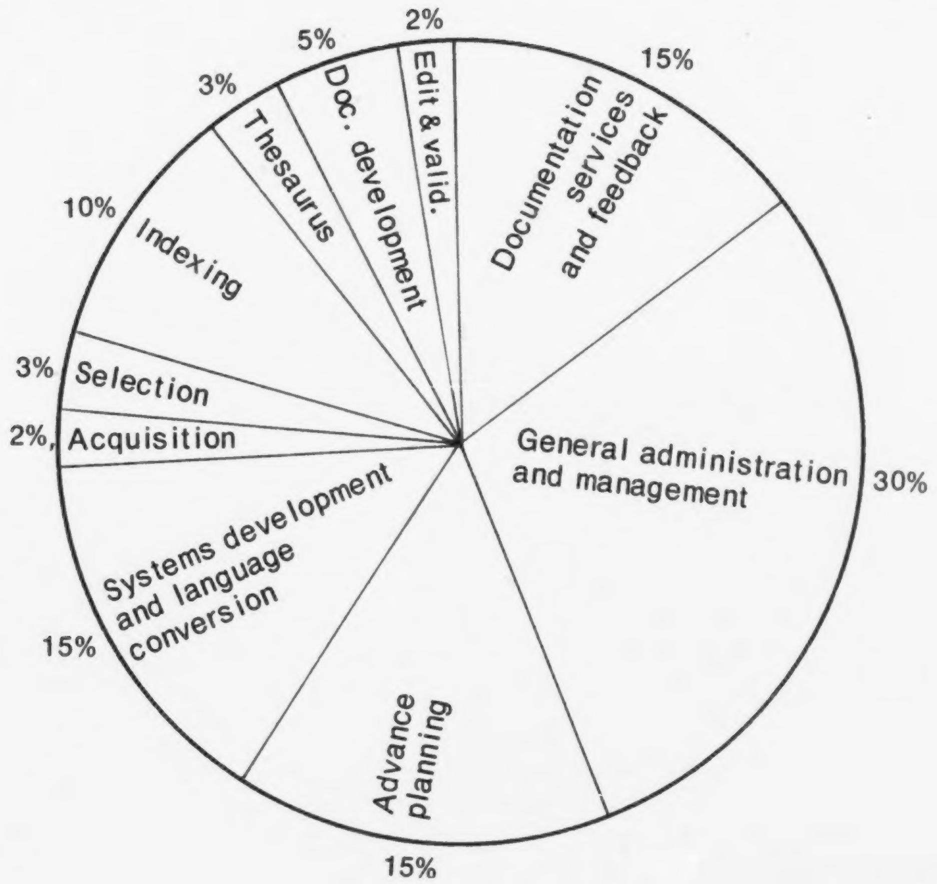
**Personnel Cost Analysis — Methodology**

URBANDOC was most interested in determining the various personnel costs of the project, both in dollars and in time. The total personnel budget was first divided into five major sections: project direction, document analysis, systems and production, data entry, and office services. Each staff member was allocated to one of these sections. Each section was represented graphically by a universe whose entirety represented 100 percent of the total staff time for that section. Although it would have been possible to include data entry with office services, the division was made so that in the future the cost of data entry arrangements could be compared with keypunching.

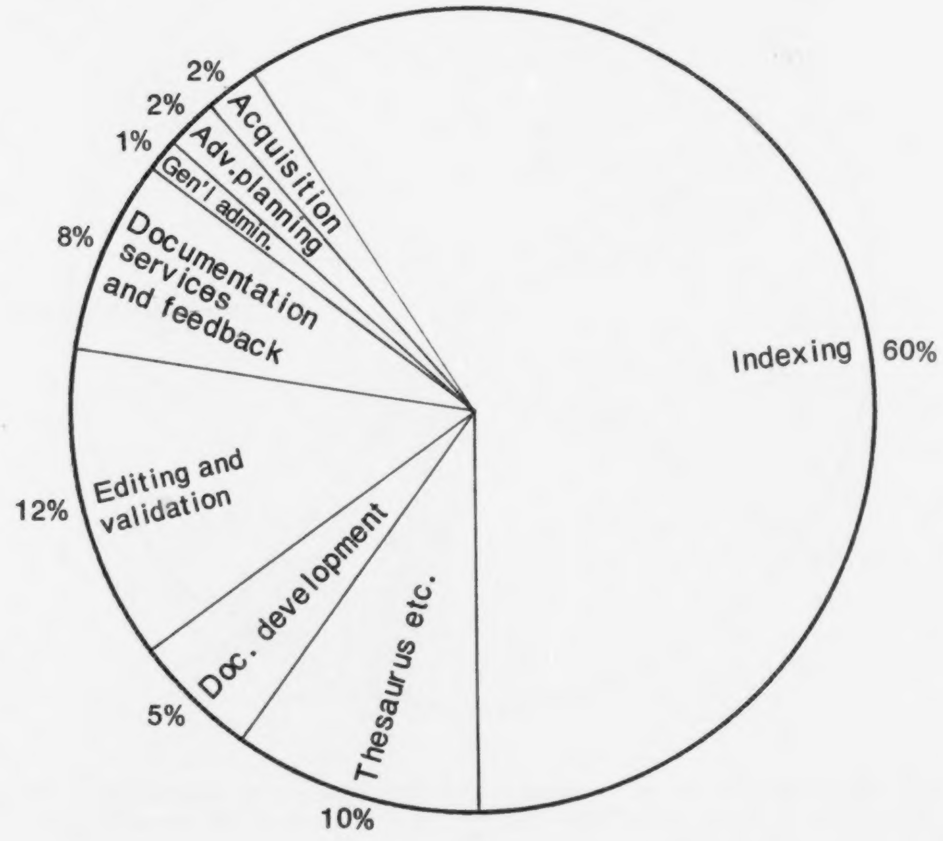
The percentages of staff time spent on various functions within the designated section were then estimated. The manning data schedules provided the categories for time analysis of staff activities, both section by section and in its entirety. Although some of the percentages may seem rather arbitrary, they were compared informally with estimates available from other documentation efforts, and found to be consistent with outside experience.

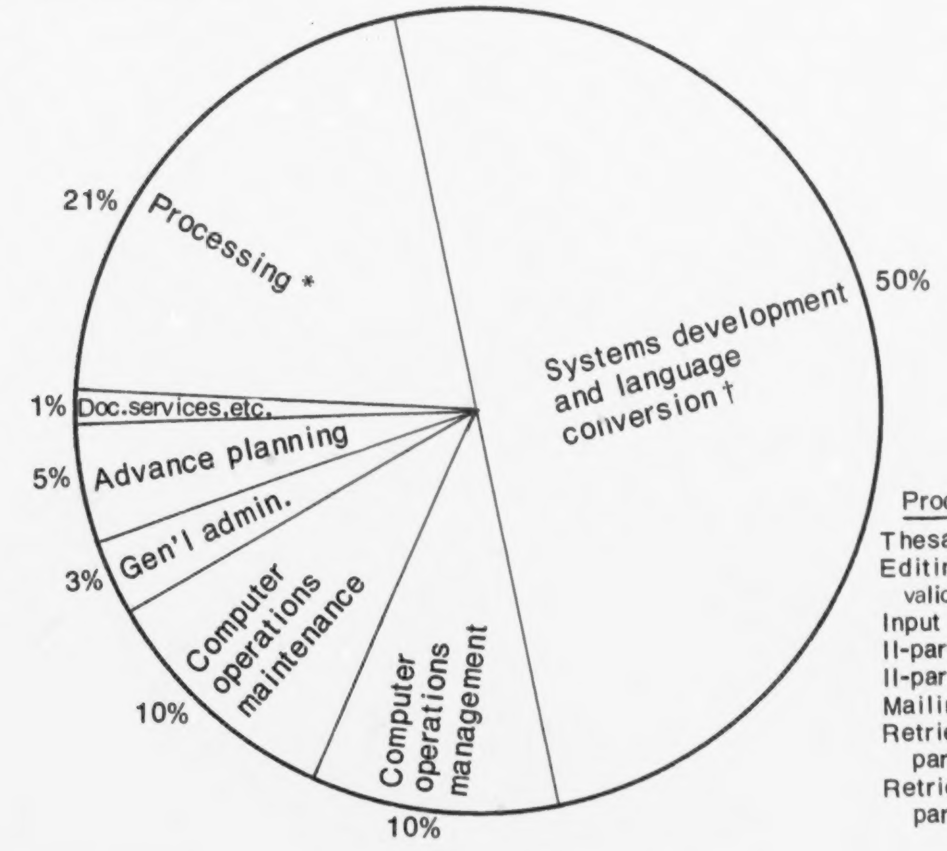
The five universes follow:

**Project Direction**



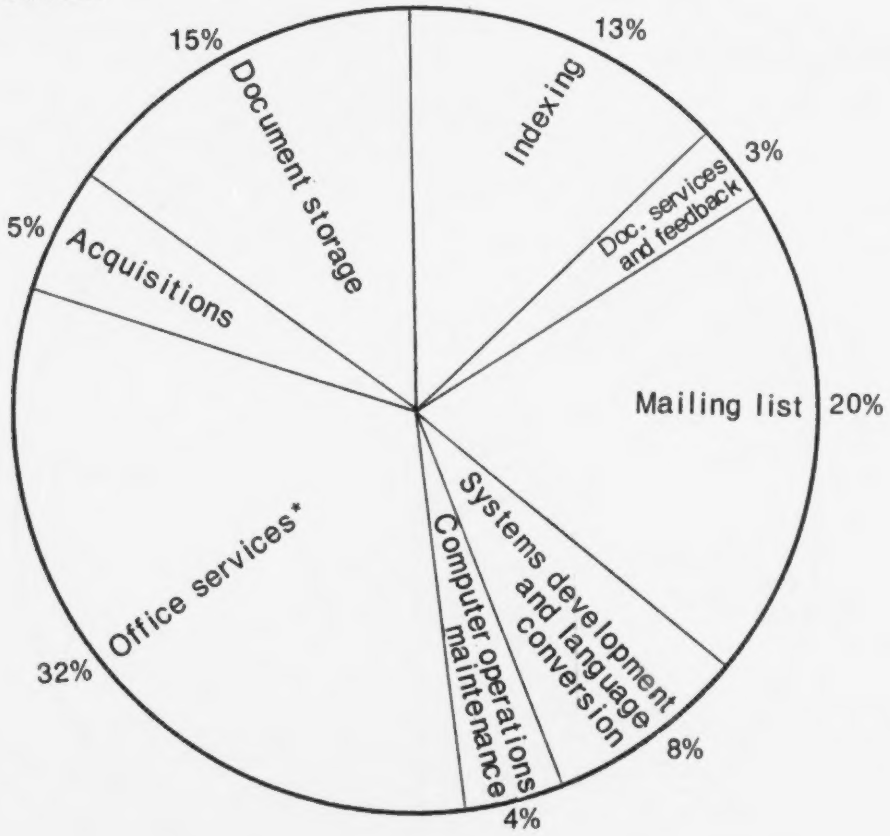
**Document Analysis**





**Systems and Production**

| Processing * | |
|---|---|
| Thesaurus, etc. | 2% |
| Editing and validation | 8% |
| Input | 2% |
| II-part 1 | 2% |
| II-part 2 | 2% |
| Mailings | 1% |
| Retrieval-part 1 | 2% |
| Retrieval-part 2 | 2% |



**Office Services**

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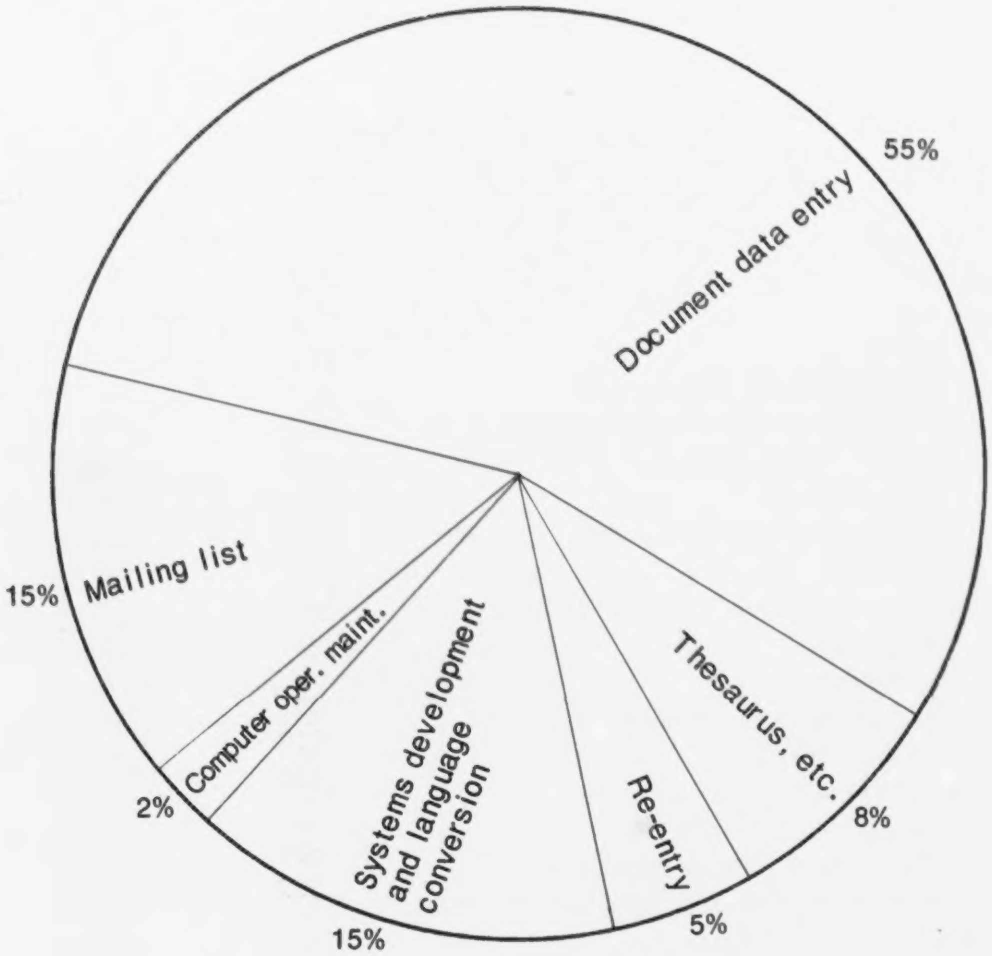
† This high percentage is due to a change in the data processing environment. In an operational situation with a stabilized data processing environment this figure can be expected to drop to approximately 30%.

* This figure is somewhat high due to the necessity, under present budgetary and administrative constraints, of using off-site office services.

**Data Entry**


55%
Document data entry
15%
Mailing list
2%
Computer oper. maint.
15%
Systems development and language conversion
5%
Re-entry
8%
Thesaurus, etc.

**Personnel Cost Analysis—Dollar Compilations**

Calculations were also made for the dollar cost of the activities within each universe. The various costs were then assembled in terms of total staff by activity. In addition, each activity cost was divided by 4000 to arrive at a cost per item of input.

| Activity | Product/Process Schedule | Annual $ | Unit Cost/4k Docs. |
|---|---|---|---|
| Acquisition | 010 | $ 1,548.50 | $ .39 |
| Selection | 020 | 570.00 | .14 |
| (Indexing | 030 | (25,203.50 | 6.30)* |
| Indexing | 031 | 22,638.50 | 5.66 |
| Documentation development | 032 | 2,565.00 | .64 |
| Thesaurus and other authority functions | 040 | 3,800.00 | .95 |
| (Data entry – keyboarding | 050 | (2,584.00 | .65)* |
| Documents | 051 | 2,090.00 | .52 |
| Thesaurus and other authority functions | 052 | 304.00 | .08 |
| Re-entry | 053 | 190.00 | .05 |
| (Editing and validation – EDP processing | 060 | (2,945.00 | .74)* |
| Thesaurus | 061 | 589.00 | .15 |
| Documents | 062 | 2,356.00 | .59 |
| Editing and validation – human | 070 | 4,256.00 | 1.06 |
| Document storage | 080 | 1,567.50 | .39 |
| Input processing | 100 | 589.00 | .15 |
| **(Input Index** | 110 | (1,178.00 | .30)* |
| Processing to camera-ready copy | 111 | 589.00 | .15 |
| Development through camera-ready copy | 112 | 589.00 | .15 |
| (Publications dissemination | 120 | (2,954.50 | .74)* |
| General administration | 122 | 2,090.00 | .52 |
| Data entry of mailing list | 123 | 570.00 | .14 |
| Mailing list processing | 124 | 294.50 | .07 |
| (Retrieval report | 130 | (1,178.00 | .30)* |
| Processing and file maintenance | 131 | 589.00 | .15 |
| Product development | 132 | 589.00 | .15 |
| Document services (other) and feedback | 150 | 6,042.00 | 1.51 |
| General administration | 300 | 6,906.50 | 1.73 |
| Advance planning | 310 | 4,968.50 | 1.24 |
| Systems development and language conversion | 320 | 18,411.00 | 4.60† |
| (Computer operations | 330 | (6,954.00 | 1.74)* |
| Management | 331 | 2,945.00 | .74 |
| Maintenance | 332 | 4,009.00 | 1.00 |
| Office services | 340 | 3,344.00 | .84 |
|  |  | $95,000.00 | $23.77 |

* indicates summary figures by group.

† This cost is due to a change in the data-processing environment, shift to third-generation equipment and conversion to COBOL. Under more normal conditions, this cost can be expected to drop proportionately.

### Computer Costs

The machine time was divided into four functions: production, systems development and language conversion, computer operations maintenance, and miscellaneous processing. Cost schedules were developed for each part of production, using the same number assigned to personnel, with the addition of the prefix C. The other functions were assigned schedules in the C 300 series, to be consistent with personnel overhead costs.

*Analysis of Computer Operations—Over-All*

| Activity | Schedule | % of Operations | Annual Hours | Annual Cost |
|---|---|---|---|---|
| Systems and production | | 44.67 | 201 | $10,050 |
| Thesaurus | C061 | | | |
| Editing and validation—Doc. | C062 | | | |
| Input processing | C100 | | | |
| *Index* to camera-ready copy | C111 | | | |
| *Index* through camera-ready copy | C112 | | | |
| Mailing list | C124 | | | |
| *Retrieval Report* | | | | |
| Processing and file maintenance | C131 | | | |
| *Retrieval Report* product development | C132 | | | |
| Systems development and language conversion | C320 | 37.56 | 169 | 8,450 |
| Computer operations maintenance | C332 | 11.55 | 52 | 2,600 |
| Miscellaneous processing | | 6.22 | 28 | 1,400 |
| | | 100.00 | 450 | $22,500 |

Computer costs are estimated on the basis of $50 per hour valuation of the following configuration at the Baruch College Computing Center: IBM 1401 12 K Computer, with four tapes, two disks, and operator console. It is rented equipment, and used on the first shift.

*Computer Costs Directly Related to Product/Process*

| Activity | Schedule | Hours/ Cycle | Annual # Cycles | Annual Cost | Unit Cost |
|---|---|---|---|---|---|
| Thesaurus processing | C061 | 3 | 6 | $ 900 | $ .23 |
| Editing and validation-doc. | C062 | 10 | 6 | 3,000 | .75 |
| Input processing | C100 | 3 | 6 | 900 | .23 |
| (*Input Index* | C110 | (6) | (3) | (900 | .23)* |
| To Camera-ready copy | C111 | 4 | 3 | 600 | .15 |
| Through camera-ready copy | C112 | 2 | 3 | 300 | .08 |
| Mailing list | C124 | 6† | 3 | 900 | .23 |
| *(Retrieval Report* | C130 | (11.5) | (6) | (3,450 | .86)* |
| Processing and file maintenance | C131 | 3.5 | 6 | 1,050 | .26 |
| Product development | C132 | 2 | 24†† | 2,400 | .60 |
| | | 33.5 | | $10,050 | $2.53 |

* Summary figures by group.

† Indicates all processing, except for mailings, in AUTOCODER mailings in COBOL, therefore relatively higher hours/cycle.

†† Or four times per updated cycle.

**Cost Summaries**

The costs are summarized in terms of three kinds of activities: preparation of the data base (input), products and product development (output), and overhead. The costs ascribable to these activities are summarized in terms of personnel, equipment, and others. If desirable, the input and output figures can be considered direct costs, and the overhead indirect.

The summaries are based on the figures in the previous schedules, but reflect certain additional considerations. The costs for systems development and language conversion were broken down into 20 percent for direct input activities, 40 percent for direct output activities, and 40 percent for overhead. (The project could not forsee a time in the predictable future when it would be possible to operate a documentation facility strictly on the basis of already developed computer programs and systems.) It also appeared desirable to be able to consider how changes in input and output volumes would affect the costs.

The greatest effect on the summary figures is in the personnel column. The system cost reallocation raises the unit costs from $10.62 to $11.54 for input and from $2.98 to $4.82 for output (both with a 4K document base). Overhead is reduced from $10.15 to $7.41 per unit. These changes do not affect the total personnel cost of $23.77 per unit.

*Summary of Activity and Unit Costs Based on 4000 Documents*

| Activity | Personnel Costs | Equipment Costs | Other Costs | Total Costs |
|---|---|---|---|---|
| Preparation of data base (Input) | $11.54 | $1.56* | | $13.10 |
| Products (Output) | 4.82 | 2.36 | $ 1.25† | 8.43 |
| Overhead and other | 7.41 | 1.91 | 16.68†† | 26.00 |
| Totals | $23.77 | $5.83 | $17.93 | $47.53§ |

* $1.38 for computer services and .18 for data entry.

† Printing costs for product development

†† The following costs were involved:

| | | |
|---|---|---|
| Fringe benefits | $ 3.56 | (really part of personnel) |
| Administrative costs including rent | 6.90 | |
| Travel | .30 | |
| Advisory Council | 2.12 | |
| Communications | .50 | |
| Supplies | 2.00 | |
| Miscellaneous | 1.30 | |

§ The total annual budget of $190,000 divided by 4000 documents amounts to $47.50 per unit. The difference between this and $47.53 is due to rounding in various calculations and analyses.

Many of the unit figures are unnaturally high, but anavoidable with a 4000 document base.

## Projections

### Productivity

URBANDOC began its projections for an operational service with the assumption that there would be a minimum turnover from the present staff and that normal improvement factors would increase its productivity. Additional positions would be created as essential and in a way to minimize the time necessary for recruiting and training.

| Staff Function | Present Staff | Projected Staff |
|---|---|---|
| Project director | 1 director | 1 director + ½ administrative assistant |
| Document analysis | 3 analysts | 4 analysts + 1 subprofessional |
| Systems and production | 2⅔ | 2⅔ (same) |
| Data entry | ½ operator | 1 operator + 1 subprofessional |
| Office services | 2 office assistants | 2 office assistants<br>+ ½ administrative assistant |
| Contingencies | | Part-time as necessary |
| | 10 people<br>(2 part-time) | 14 people<br>(1 part-time) |

Although the projected staff still would be small for an oprational facility, it requires integrating four new people into the operation – five if normal turnover persists. It would also involve testing the ability of the project to use the personal services of subprofessionals and machine services of new data-entry devices. With reasonable success in all areas, it should be possible to expect a capability of 8000 units of input per year, and to hope for as many as 10,000.

## Costs

The table that follows compares the present budget of $190,000 (4000 units of input) with a projected one of $280,000 (8000 units of input). The most dramatic reduction will be in the indirect costs, although direct expenses will also decrease per document of input.

*Urbandoc Costs, Current and Projected*

| | | | | Unit Cost | |
|---|---|---|---|---|---|
| **Account** | **Schedule** | **4,000 docs. Annual $** | **8,000 docs. Annual $** | **4k documents** | **8k documents** |
| Salary and wages | 010-340 | $ 95,000 | $146.000 | $23.77 | $18.25 |
| Data-entry equipment | 400 | 750 | 3,750* | .18 | .47 |
| Computer services | 410 | 22,500 | 35,000 | 5.65 | 4.38 |
| Office equipment | 420 | | 1,470† | | .18 |
| Salary and wages, fringes | 500 | 14,250 | 22,000 | 3.56 | 2.75 |
| CUNY overhead | 510 | 27,600 | 28,500 | 6.90 | 3.56 |
| Travel | 610 | 1,200 | 2,400†† | .30 | .30 |
| Advisory council | 620 | 8,500 | 8,500 | 2.12 | 1.06 |
| Communication costs | 630 | 2,000 | 4,000 | .50 | .50 |
| Printing costs (for product develop.) | 640 | 5,000 | 5,000 | 1.25 | .63 |
| Supplies | 650 | 8,000 | 16,000 | 2.00 | 2.00 |
| Miscellaneous | 660 | 5,200 | 7,380 | 1.30 | .92 |
| | | $190,000 | $280,000 | $47.53§ | $35.00 |

* This includes the establishment of a set of entirely new data-entry procedures. including the acquisition of keyboard-to-magnetic-tape device.

† This figure has been added since the project contemplates the necessity of on-site visits by nonproject personnel.

†† This will include site visits by nonproject personnel.

§ $190,000 divided by 4000 = $47.50 The $.03 difference is attributed to rounding in various calculations and analyses.

# CONCLUSIONS AND CAVEATS

In retrospect, the most significant point about URBANDOC is that it happened. That it seems to have attained approximately the same levels of success as have been ascribed to similar efforts in other fields is an added bonus. The project disproved the myth that the social sciences were not amenable to modern techniques of documentation, particularly those that employ the computer in one way or another. From here on in, the issue will not be whether there *can* be a bibliographic information system for urban affairs, but *how*.

It should be emphasized that the URBANDOC demonstration did not prove – nor did it set out to do so – that every individual strategy employed by this particular project should be continued in an ongoing system. Certain changes are inevitable with the coming shift to third-generation computing equipment; others will be stimulated by the developing state of the art.

The following paragraphs do not repeat all the conclusions – and associated caveats – that are mentioned in earlier chapters. They do concentrate on those major consideration that must influence any decision to continue a bibliographic information system for urban specialists.

## Document Analysis and Retrieval

The central focus of the URBANDOC effort was the retrieval of bibliographic references relevant to specific queries about urban problems. The project was reasonably satisfied with the results of its computer searches. There is no point in wishing that the terminology in the urban-related disciplines were more precise, more hierarchical in the relationships of the terms to each other, and less dynamic. There is also no point in wishing that users could always express their requirements in the kinds of precise search statements that seem characteristic of the harder sciences.

The project could only work within the "givens" of the situation. An attempt was made to provide as much guidance as possible in the *General Manual*. Chapter IV, *"Document Analysis: Content,"* concerns itself with the creation of a valid bibliographic data base. Without it, the following chapter, *"Searching,"* would be meaningless. Even with the best of efforts, however, certain problems in the content analysis of the documents should be recorded for the benefit of a future information system in this area.

### Indexing Consistency

With all the guides developed by URBANDOC and recorded in the *General Manual*, it is still difficult to guarantee a high degree of consistency in content analysis. It is specifically not a problem that could be solved by the transition from manual to machine systems for handling bibliographic data. The reasons why the problem seems greater in the present environment are threefold. First, user expectations of manual systems with services free of charge were not the same as their expectations of an expensive mechanized one. Second, users of a mechanized retrieval system are far more dependent upon correct input of descriptors than those who are free to browse in printed catalogues and indexes. Third, traditional subject headings frequently attempted only a very gross cut of the literature.

One URBANDOC solution to the problem of consistency was for the project director to review the bulk of the content analysis. Another solution was for one document analyst to review the work of another. The double examination revealed that even a small staff working in concert could vary considerably in its approach to a single document. It is too bad, in retrospect, that the project did not record the numbers of differences or the ways in which they were resolved. In some cases the original analysis was changed, while in others additional descriptors were added. While both types of solutions were expensive in terms of personnel time, the second solution added to the permanent cost of maintaining the record as well.

Unfortunately the project has little advice to pass on to a large-scale, more cost-conscious effort at handling the difficult urban literature. The development of subject specialization among the analysts is one possibility. When certain types of reports were handled routinely by one URBANDOC analyst, their analysis could be predicted with a high degree of accuracy. Between analysts, however, this was more difficult.

The greater the inconsistency in the analyses, of course, the greater the chance of a search failing to produce a match between the descriptors in the formal search statement and the descriptors stored in the file as the result of document analysis, or indexing. In a very large system the discrepancies in indexing may constitute only a minor problem for those users who can afford to miss some of the documents that should have been retrieved. In a smaller system with fewer possible answers, or in a large system where the need is for exhaustive retrieval, standardization is more critical.

### Indexing Accuracy

The problem of accuracy in subject analysis has not been scrutinized in the literature in the same way that consistency has been pursued. However, the users of a mechanized information system are not likely to tolerate retrievals that miss the point of documents, no matter how consistently they do so. Project URBANDOC discovered that its analysts rarely disagreed on the meaning of a document. Also, the field-test materials were never challenged as to the analysis of the documents being cited.

Whether the analysis was really as accurate as it seemed, or whether this degree of accuracy could be projected for a larger operation, is difficult to answer. It seems reasonable to assume the contrary with a large volume of input being processed by a large and varied staff. Specialization and continued training are obvious answers, but URBANDOC is not sure they are sufficient.

### Text Processing Alternatives

One possible alternative is the elimination of the document analyst, letting the analysis become a function of the computer. There are now programs available, such as TEXTPAC from the IBM Program Library, which will enable the user to enter the text of a document into the computer, and have it prepare automatically an inverted file of the words of the text (minus articles and other nondistinctive terms). To process the entire text would, of course, greatly increase the computer costs. (The computer costs are not only those of processing the input, but also of entering and storing it.)

Whether text processing would be an effective system for handling urban documents is a larger question than can be dealt with properly at this point, let alone examined in detail. However, the possibility should be on the record.

## File Organization

There were, of necessity, two information files at URBANDOC: the physical file of stored documents and the electronic file of bibliographic records on computer tapes. The first could have been eliminated had the Project decided to discard the documents or pass them on to another facility. The tape files, of course, are the core of the system. They are described in detail in the *Operations Manual*.

Even though many of the URBANDOC decisions regarding the organization of its bibliographic records were dictated by the requirements of the Combined File Search System, it is appropriate to single out those that were more administrative than technical in nature and to evaluate them separately.

### Over-all File Organization

The basic design philosophy of the Combined File Search System is not at issue here. Given the existence of the project at a different period, it is highly probable that other equipment and systems would have been selected and/or devised as one of the instruments in proving the URBANDOC demonstration. However, these are now part of the background of the project. Suffice it to say that URBANDOC was not alone in the choices it had to make in regard to equipment and systems, as evidenced by the use of the 1401 CFS System at the Food and Drug Administration, the National Institute for Mental Health Information, the *Engineering Index*, the American Society of Metals, and other institutions and organizations.

In order to evaluate the effectiveness of the method of file organization, it is necessary to understand the basic approach taken by the systems architects in constructing the CFS System. Specifically, there was a Document Master File containing all the information about a particular document entered into the file. This information contained both the content analysis terms (terms describing the document's contents) and the descriptive analysis information (the bibliographic references to the document). Each reference was identified by a unique document identification number. This number also served to tie together the various records constituting a reference. As an adjunct to the Document Master File there was the Inverted File, which contained all the descriptors appearing in the Document Master File along with the document identification numbers of the references in which they were used.

In file maintenance, input was edited and validated, the Document Master File updated first and the Inverted File updated as a by-product of the Document Master File. When searching, the Inverted File was examined first to locate those documents that satisfied at least some of the requirements of the search statement. These specific references were examined in detail to determine if they met the other requirements in the search statement. Although the full Document Master File must be passed through the computer during both procedures, the time spent in processing the irrelevant records was judged as being minimal. (These procedures are discussed in greater detail in the *General Manual* and *Operations Manual*.)

The Combined File approach to storage and retrieval worked well for demonstration purposes. In the judgement of the staff it would continue to be effective until the file reached forty thousand bibliographic records. This could approximate one year of input, depending upon administrative decisions on the size of the document base considered appropriate to the particular system. If the files were being searched for current awareness purposes only, then probably no more than five thousand documents would be involved at any one time, quite manageable by the Combined File Search. If, however, several years of input are to be available for retrospective searching at any one time, then other arrangements should be devised.

### Document Master File Sequence

In the system used by URBANDOC, administrative problems in file organization arise long before the forty-thousand-document point, specifically at the end of one reel of tape. This can be after four or five thousand documents, depending on the length and internal organization of the individual records. If the document identification number is a straight sequential order, then no decisions are required as the reel is simply closed when no more space is left.

Under such a procedure, the Master Document File will then be organized by the sequence in which the materials are processed, with no regard for publication date, subject matter, or nature of the issuing agency. Not only the individual reels but also the entire tape library will therefore be quite randomly organized, except insofar as the dates of publication and of processing are reasonably in agreement. This would be less serious in a disk system, where randomness is integrated into the systems design. It is assumed that appropriate provisions would be made to allow for sorting the records into more meaningful sequence when so required.

The document numbers devised by URBANDOC (and explained in detail in the *General Manual*) were, of course, not at all sequential as to processing order. They started with a character indicating type of issuing agency, and went on to give a brief identification of the agency, title, and date of publication. The staff found this to be a useful shorthand way of referring to the individual documents, but it took more time to devise than might be warranted in an economically operational situation.

### Organization of Multi-tape Files

One advantage of the present document number was that the staff had the option, on updating, of merging new files with old. As the tape library grew larger, it would have been possible to segregate subsets by reel. State documents, for example could be kept together through many updates instead of being scattered among the other documents.

The long-range advantage of this option could not be demonstrated with the restricted size of the demonstration. Because styles of descriptive analysis had changed, it seemed better to have one tape representing the most current thinking of the project. For this reason, the project did not merge the final year of input with those of previous years.

## Processing Constraints

In general, URBANDOC was satisfied with the results of the Combined File Search System. This was especially true after the project had available the seven hundred programming changes that were made by various members of the informal CFS users group. Remaining technical problems that would require resolution for an ongoing system are mentioned in the *Operations Manual*. There are also some administrative constraints on the use of the system as is, and they are indicated below. The same attitude of satisfaction plus caveats pertains to the publications functions that were more under URBANDOC's control.

### File Maintenance Processing

The processes associated with file maintenance are so time-consuming that it is not practicable to make either corrections or additions to the searchable file for less than five hundred items. URBANDOC had done it for less, but only because certain operations were necessary to get on with the demonstration. Even then, certain noncritical errors were allowed to remain on the final version of the Document Master File because they were too expensive to correct.

At the other end of the spectrum, the staff estimates that the CFS File Maintenance Procedures would cause problems with a regular input volume of over one thousand documents in one batch, particularly if it were necessary to break into the processingruns while other users pre-empted the computer. This processing is not only time-consuming, but composed of many individual processes which are confusing to an operator who is not familiar with the system.

Once the tape file version had been updated, additional processing constraints prevent there being frequent printed editions of the entire Document Master File. The project had hoped that it would have, in essence, a book catalogue that could be constantly cumulated. This proved so costly in terms of processing time that the project contented itself with few cumulative editions, and frequent printed supplements to the printed Document Master File.

### Publications Processing

While the COBOL programs produced a completely satisfactory *Input Index*, the time required to process the data is excessive, namely a two-to-one ratio when compared to symbolic programming languages like AUTOCODER. Stated simply, COBOL is not efficient on second generation computers, even though this lack of efficiency can be justified by its machine-independence. To produce the present *Input Index* with programs developed under COBOL in a production environment would create serious problems in terms of both machine time and cost. To process an issue ten times as large would be disastrously expensive.

Preliminary investigation has led the URBANDOC staff to believe that the processing situation regarding COBOL would not be as serious on third-generation equipment. If the URBANDOC publications module is to be used in an ongoing operation, then it seems wise to provide first for an opportunity to test it on the IBM 360 or similar computer. The same 1401 programs run on the 360 with 1401 compatibility might show some improvement in execution time. However, URBANDOC feels that only complete conversion to 360 COBOL could hope to solve the problem.

## Transferability of the URBANDOC "System"

Despite the caveats of the preceding paragraphs, it is inevitable that there might be requests for the URBANDOC tapes: the bibliographic files, the Thesaurus, and programming system. Those would be especially useful in a library and information science laboratory, where there is still much to be learned, even from a second-generation system. Project experience to date indicates that the publication of the final report might also generate requests from users with a potential commercial interest in bibliographic information systems. For them, also, there are lessons in the URBANDOC tapes.

Much as the URBANDOC staff would like to respond to these requests, the problems should be made clear at the outset.

### Tape Reproductions

Since the URBANDOC project will cease to exist upon publication of these reports, the burden of providing any post-publication services will fall directly on The City University of New York. The situation is less drastic than it might seem, since the principal staff members of the project have been transferred to the Graduate Division of the university. However, their new responsibilities will preclude any substantial attention to the post-project needs of potential users. The great cost involved in copying and transmitting tapes will make this kind of service impossible unless the necessary financial arrangements can be made, and provided the 1401 IBM computer continues to be available.

### Programs

Although the project manuals discuss the system design in detail, they do not, of course, contain listings of the actual programs. The punched cards, tapes, and listings of both source and object programs have been transmitted to HUD. There are no further publications plans for these items.

## Economic Constraints

The economic feasibility of a documentation effort like URBANDOC is not completely clear. To determine it, there must be evidenced a desire, a need, and an effective demand (e.g., a willingness to pay) for the proposed products and services. Throughout the course of the URBANDOC demonstration, there were unsolicited requests for the Thesarus, the *Input Index*, and computer retrievals. Reactions to papers presented in conferences and journals also indicated an interest in a documentation effort for urban affairs. While these requests could be used to measure interest and need, they could not determine an actual willingness to pay for such a service.

A measure of the financial support available for such a documentation effort could have been obtained through a professional market survey. Although this was not done, some marketability of documentation products were ensured. This was based in part on the requests for subscriptions to the *Input Index* and in part on the interest of several publishers of information products in the possibility of producing the *Index* commercially.

Even with an income-producing ability, the degree of self-sufficiency that could be attained is yet to be determined. Could such an effort be completely self-supporting or would it require subsidizing? The answer depends upon a consideration of the income that could be generated in comparison to the costs that would be incurred.

In determining the costs of a documentation effort, several approaches to cost analysis could be taken. One could consider the costs by function, i.e., document analysis, systems analysis, administration, and other overhead costs. Alternatively, one could combine the costs of the various functions to arrive at an input cost for storing a reference and at an output cost of reproducing the reference, either as part of a publication or as a retrieval.

The distinction between the costs of the two basic capabilities – publication and retrieval – does not emerge clearly in an examination of the cost figures indicated in this chapter. Although the figures given do separate the two kinds of output costs, these were only for field-test products. URBANDOC estimates the cost of constructing a publications file alone to be two-thirds the cost of publications and retrieval. The real problem in assessing economic feasibility is in the input cost.

It appears that an operational documentation center for urban affairs could not be financially self-supporting. The costs of supporting a retrieval service far exceed the income that such a service would generate. Even a financially ssuccessful *Input Index* could not compensate for the deficits of the retrieval portion of the operation. A retrieval service does not appear to be ready for the marketplace without some continuing subsidy.

It is even questionable whether such a documentation center could be self-supporting without the retrieval service, that is, based only on a publications program. URBANDOC has felt that such an operation could be successful with the active cooperation of the professional societies in soliciting subscriptions. On the other hand, publishers interested in producing commercially the *Input Index* required some assurance of a continuing subsidy to cover the costs of creating and maintaining the data base.

Since some subsidy appears to be necessary, the next issue is the source of the funds. One alternative could be a professional society or perhaps a consortium of societies. Although possible, it does not appear probable in the near future. The issue of foundations, also a possibility, would probably depend upon an assumption that the subsidy would be temporary until the center became self-sufficient (which it may never be). It would then appear that the additional funds must continue to come from some government source. It would seem that the field needs something like URBANDOC on an operational basis. If it is to have it, it does not appear feasible without major federal support.

# ALTERNATIVES FOR THE FUTURE

The URBANDOC Project that was established at The City University of New York with the aid of an Urban Renewal Demonstration Grant was a limited effort. The level of funding alone – a half million dollars – indicates that it could do not more than test the applicability to the social sciences of documentation techniques being developed in science and technology. Having accomplished its mission, and reported in detail on its findings in the present volume and accompanying manuals, all that is left for the URBANDOC staff is to record any additional impressions that might be relevant to a future bibliographic information system for urban affairs.

## Recognizing the Need

That there is a need for increasing society's access to urban information is generally recognized in the urban community. Little else has been accomplished in the way of supplying the particular kind of urban information that was being handled by URBANDOC. During the same period, however, the larger scientific and technical community has also come to appreciate the necessity of this kind of information system, and to acknowledge it in a widely distributed report.

The National Academy of Sciences, in the 1969 document known informally as the SATCOM Report,[◇] has this to say:

> We urge that the sponsors of major programs of research, analysis, and, in particular, field experimentation in such contexts as resources management, environmental control, transportation systems development and urban renewal consider it one of their central tasks to develop the information systems that their scope and impact require. Information-management activities should receive focused attention at a high level, assuring continuity and authority in their administration. Full use should be made of the Institutions and pertinent resources in both the government and private organizations under the policies and procedures we have advocated.

That page (223) is the only place in the report – other than the listing of Project URBANDOC as one of the "Examples of Bibliographic Records in Machine-Readable Form" – that urban information is mentioned specifically. Most of the examples of information services are drawn – by necessity – from technology and the nonsocial sciences. That is where the large-scale efforts have been concentrated until now. However, the URBANDOC prototype of retrieval and index publications are squarely in line with those mentioned in connection with other disciplines.

## Satisfying the Need

The URBANDOC staff would not recommend that a national effort be attempted with anything less than a national level of support. This implies not only an adequate supply of

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[◇] National Academy of Sciences – National Academy of Engineering. Committee on Scientific and Technical Communication, *Scientific and Technical Communication: A Pressing National Problem and Recommendations for its Solution* (Washington, D.C.: 1969), 322 pp.

dollars, but also responsibility. Any computer-based urban information system at this point in time should also be adequately related to information developments in nonurban science and technology. This includes both bibliographic and physical access techniques.

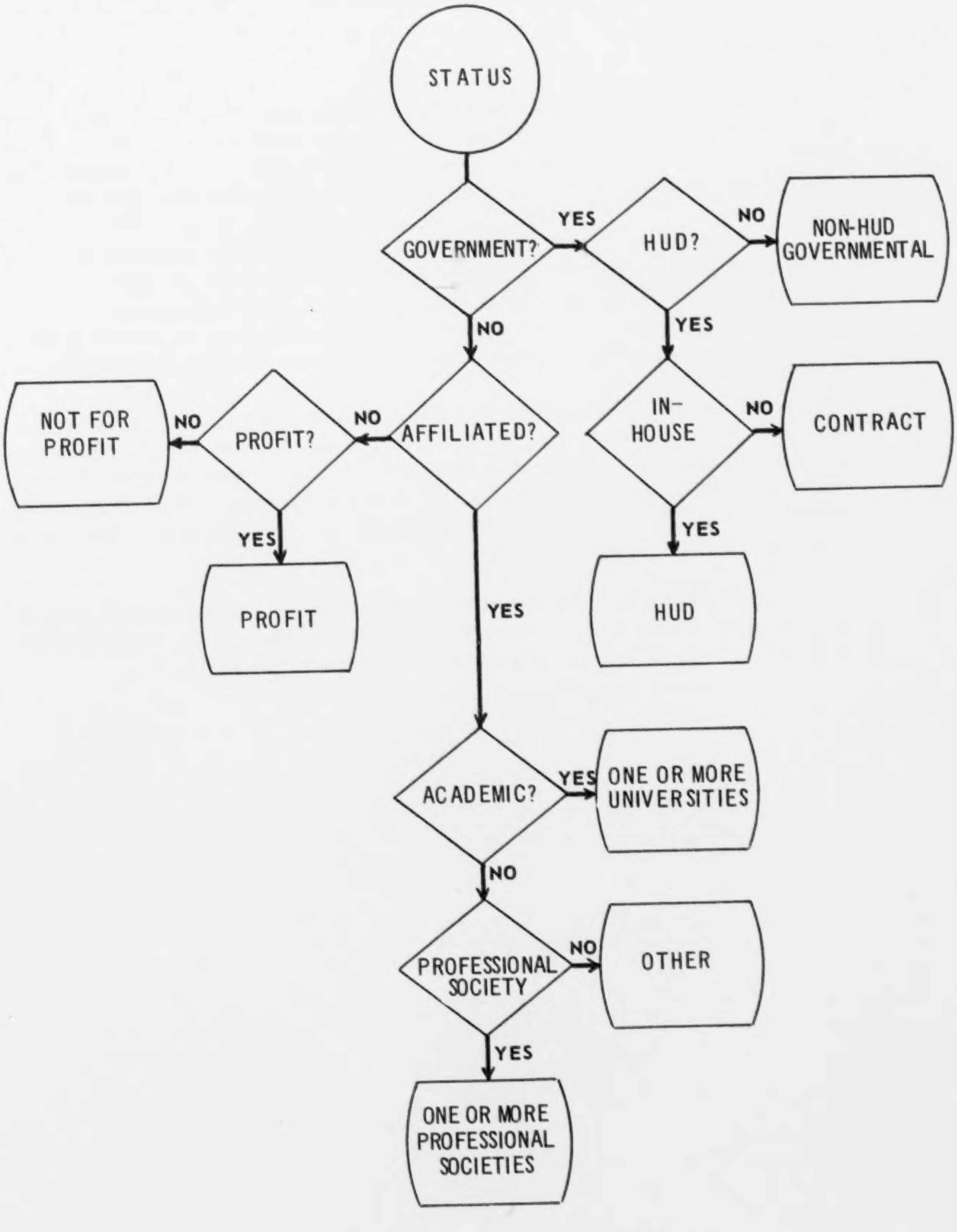
**Institutional Status**

There is no one institutional course of action that clearly satisfies all the organizational and professional interests in an information system of the scope indicated by the URBANDOC and SATCOM reports. The National Academy of Sciences assigns a large share of information responsibilities in all fields to nongovernmental organizations:

> We recommend that, as a guiding principle, all government-sponsored scientific-and-technical-information programs directed in major part to workers outside government service, or to workers in government whose activities are similar to those outside, should be managed, in whole or in part, by the appropriate societies or institutions jointly created by such societies or by commerical organizations.

On the other hand, there seems to the URBANDOC staff to be a great deal of logic in assigning the responsibility directly to the federal agency most directly involved in creating and using urban information: the Department of Housing and Urban Development. HUD will almost certainly have to be one of the major sources of funds, if not the major source. It will also have to issue the directives that make the HUD-funded reports available to the documentation facility.

There are actually at least eight identifiable alternatives for institutional arrangements, two of which involve HUD directly. They are all indicated on the following chart. Examples of each can be found throughout the information community.


STATUS
GOVERNMENT?
YES
HUD?
NO
NON-HUD GOVERNMENTAL
YES
IN-HOUSE
NO
CONTRACT
YES
HUD
NO
AFFILIATED?
NO
PROFIT?
NO
NOT FOR PROFIT
YES
PROFIT
YES
ACADEMIC?
YES
ONE OR MORE UNIVERSITIES
NO
PROFESSIONAL SOCIETY
NO
OTHER
YES
ONE OR MORE PROFESSIONAL SOCIETIES

### Functional Responsibilities

The choice of one course of action in terms of institutional status does not necessarily imply that all functions of an information system either could or should be performed under the direct aegis of a parent body. The current situation in science and technology is one of diversity in this regard. It is possible to construct a model in which functions are divided between government, the professional societies, the universities, and various profit and non-profit bodies.

The chief functional areas in a bibliographic information system are: document collection, document analysis, data entry (including error detection and correction), input processing, product processing, and product distribution. The first four are input items; the last two outputs. Either group can be a centralized operation; either group can admit many participants. The funding agency of the future might want to consider the trade-offs between the economies and consistencies possible in an centralized operation and the enrichment possible when many minds can be brought to bear on a problem.

### Urban Information as an Industry

The field that started out as "documentation" and then renamed itself "information science" is rapidly becoming an industry. It is a positive development in as much as information services are now being subjected to a market economy. That economy is not, however, free of government subsidy. The subsidy is direct when the data base is created at government expense; it is indirect when a large portion of the customers are public bodies. This will be especially true for any information industry that seeks to serve the urban area.

It will therefore behoove the government — and particularly HUD — to monitor the situation carefully. Too much decentralization could result in a multiplicity of services that confuse more than inform their potential customers. The "repackaging" trend in particular worries the present URBANDOC staff. Properly handled, it can mean putting bibliographic data into more usable forms. With less discretion, the information explosion could be dwarfed by an information systems explosion. Being harder to manage by individual action, it may merit considerable HUD attention.

## APPENDIX A / PROTOTYPE RETRIEVAL REPORTS

### Introduction

The prototype *Retrieval Reports* provide examples of the search capability developed by Project URBANDOC. The six "queries" were staff-designed, and intended to illustrate particular features of the system. For more detailed descriptions of the types of search strategy employed in these and more elaborate queries, the reader is referred to the *General Manual*.

**Sample Queries**

I. "The Central Business District in Cities of 100,000 to 500,000 Population." This query employed both AND and OR relationships, and also linked subject and geographic descriptors. CBD is the subject descriptor used in the search statement, and it is coordinated in an AND relationship with either CITY SIZE-12 OR CITY SIZE-13. (The latter are Census Bureau codes whose use is discussed earlier in this volume and also in the *General Manual*.) Five citations are displayed in the *Retrieval Report*.

II. "Reports on Law Enforcement by Regional Agencies." This query also used the AND relationship between descriptors, the first of them being LAW ENFORCEMENT. The second term in the search statement, #O$, used the ability of the system to truncate descriptors. In this case the descriptor was the document identification number itself, in which the first letter indicates that the issuing agency was a regional or metropolitan body. (See also the *General Manual*.) The preceding # served to distinguish document identification numbers from subject terms beginning with O. The truncation symbol, $, does not appear in the *Report*, although it was used in the machine-readable form of the query. Five citations are displayed in the *Retrieval Report*.

III. "Population Characteristics in Metropolitan Indianapolis." This query coordinated the subject descriptor POPULATION CHARACTERISTICS with the Census Bureau's 1960 code for the Standard Metropolitan Statistical Area in question, number 0720. One citation is displayed.

IV. "Role of Easements in Historic Preservation." This query coordinated two subject descriptors in a simple AND relationship, and resulted in the retrieval of one citation.

V. "Measures for Environmental Protection Outside the U.S." This query coordinated the subject descriptor ENVIRONMENTAL PROTECTION with the truncated geographic descriptor, in this case using the F/ that precedes all non-U.S. country names.

VI. "Poverty Programs or Social Services in a Model City Program." This is a straight subject query, with one AND and one OR in the search statement.

## User Instructions

Each *Retrieval Report* contains one or more citations. Each citation constitutes a bibliographic reference to an individual document in the system satisfying the parameters of the search statement. The individual citations are separated from each other by document numbers and dotted lines. Where there is more than one citation per ***Retrieval Report,*** the entries are in document number sequence.

Each citation is divided into three parts. The first of them, Searchable Section, contains [illegible] the descriptors assigned to the document by the document analyst, including any modifiers and Census Bureau codes (used as descriptors instead of place names). Those terms which caused the document to be retrieved for this particular search statement are flagged with an alphabetic character. For further details on this flag, refer to the project *Manuals.*

The second part of the citation contains a series of Free Text Segments, each with an identification number of its own. These identify the bibliographic data element that is to be displayed in the following line. Those elements that appear in the prototype *Retrieval Reports* are:

| | |
|---|---|
| 001 | personal author (main entry) |
| 002 | corporate author (main entry) |
| 003 | anonymous author (main entry) |
| 005 | joint personal author |
| 006 | joint corporate author |
| 007 | consultant |
| 008 | miscellaneous corporate name |
| 009 | miscellaneous local place name |
| 011 | title (distinctive) |
| 015 | title (non-distinctive) |
| 016 | French title |
| 017 | German title |
| 021 | imprint and collation |
| 022 | imprint and collation for subdocument |
| 023 | abstract |
| 025 | Urban Planning Assistance Program Project Number |
| 031 | legal citation |
| 036 | literature citation |
| 056 | acquisition information |
| 097 | geographic index place name |

In some cases Free Text Segment 21 (Imprint and Collation) refers to a journal article. The journal itself is identified by a CODEN, also described at length in the *General Manual.* Those CODENS that appear in the prototype *Retrieval Reports* are listed below:

| | |
|---|---|
| AIPJ-A (or AIPJ) | *American Institute of Planners. Journal* |
| DOWNSS | *Downtown Idea Exchange. Special Study* |
| HISP-A | *Historic Preservation* |
| JOHO-A (or JOHO) | *Journal of Housing* |

The third part of the citation is Subject Headings. It repeats those few descriptors that are also used to produce the Major Subject Listing illustrated in Appendix B.

## PROTOTYPE RETRIEVAL REPORTS

```
     THE CENTRAL BUSINESS DISTRICT IN CITIES OF 100,000 TO 500,000 POPULATION


ADOWNSS69..UBB      ****************************************

SEARCHABLE SECTION
  =ADOWNSS69..UBB
  ARTICLES
  AWARDS, COMPETITIONS
  BEAUTIFICATION
A CBD
C CITY SIZE-13
  DATES                    PUBLICATION  S54196900  ENTRY        S54196904
  GEO
  OPEN SPACE
  PEDESTRIANWAYS
  RENEWAL AREAS
  OSMSA-1040
  410623425
  FREE TEXT SEGMENT 003
   DOWNTOWN IDEA EXCHANGE. SPECIAL STUDY
  FREE TEXT SEGMENT 008
   CAPITAL CENTRE RENEWAL PROJECT, ST. PAUL, MINN.
  FREE TEXT SEGMENT 011
   URBAN BEAUTIFICATION MEMO NO. 2.
  FREE TEXT SEGMENT 021
   DOWNSS. 16-1-2. JAN. 15-69.
  FREE TEXT SEGMENT 022
   SIGN CONTROL BULLETIN NO.5
   DOWNSS. 16-1-2. FEB. 15-69.
  FREE TEXT SEGMENT 036
   HOUSING AND URBAN DEVELOPMENT DEPT. 1968 HUD AWARDS FOR
      DESIGN EXCELLENCE. 1968. 68P. URBANDOC NO. DHUD...68DE
  FREE TEXT SEGMENT 097
   MINN., ST. PAUL
 SUBJECT HEADINGS
      6ABEAUTIFICATION
      6BRENEWAL AREAS
      6CCBD


KNORCGRRC68DG       ****************************************

SEARCHABLE SECTION
  =KNORCGRRC68DG
  BOUNDARIES
A CBD
B CITY SIZE-12
  DATES                    PUBLICATION  S54196800  ENTRY        S54196810
  ECONOMIC BASE STUDIES
  FINANCIAL SOURCES
  GEO
  GNRP
  GOALS
  GRANTS                   FEDERAL                 MUNICIPAL
  LAND USE STUDY
  POPULATION CHARACTERIST
  PUBLIC IMPROVEMENTS
  RELOCATION               COMMERCIAL              RESIDENTIAL
  RENEWAL PLANNING
  SITE PLANNING
  SPECIAL REPORTS
  STATISTICS
  ZONING
  OSMSA-0640
```

```
    THE CENTRAL BUSINESS DISTRICT IN CITIES OF 100,000 TO 500,000 POPULATION

  560411065
  FREE TEXT SEGMENT 002
   GREENSBORO, N.C. REDEVELOPMENT COMMISSION
  FREE TEXT SEGMENT 007
   CITY PLANNING AND ARCHITECTURAL ASSOCIATES
   HILL, ERIC AND ASSOCIATES, INC.
  FREE TEXT SEGMENT 011
   DOWNTOWN GENERAL NEIGHBORHOOD RENEWAL PLAN AND DATA
  FREE TEXT SEGMENT 021
   1968. PAGING VARIES
  FREE TEXT SEGMENT 025
   N.C. R-63
  FREE TEXT SEGMENT 097
   N.C., GREENSBORO
SUBJECT HEADINGS
      6AGNRP
      6BLAND USE STUDY
      6CCBD

KNORCGRRC68PR       ****************************************

SEARCHABLE SECTION
  =KNORCGRRC68PR
A CBD
B CITY SIZE-12
  DATES                    PUBLICATION  S54196800  ENTRY        S54196901
                           CONTENT      U54196800  CONTENT      L54195800
  DEMOLITION
  FINANCING
  GEO
  LAND ACQUISITION
  LOW-RENT HOUSING         NON-PROFIT
  PERIODIC REPORTS
  REHABILITATION
  RELOCATION
  RENEWAL AREAS            INSTITUTIONA            INVENTORY
                           RESIDENTIAL             COMMERCIAL
                           INDUSTRIAL
  STATISTICS
  TURNKEY
  OSMSA-0640
  560411065
  FREE TEXT SEGMENT 002
   GREENSBORO, N.C. REDEVELOPMENT COMMISSION
  FREE TEXT SEGMENT 015
   PROGRESS 1967-68
  FREE TEXT SEGMENT 021
   1968. 16P.
  FREE TEXT SEGMENT 097
   N.C., GREENSBORO
SUBJECT HEADINGS
      6ARENEWAL AREAS
      6BLOW-RENT HOUSING

KPENNERRA68AR       ****************************************

SEARCHABLE SECTION
  =KPENNERRA68AR
A CBD
  CITIZEN PARTICIPATION
B CITY SIZE-12
  DATES                    PUBLICATION  S54196800  ENTRY        S54196901
  DEMOLITION
  GEO
  LAND ACQUISITION
  LAND DISPOSITION
  LPA
  MODEL NEIGHBORHOODS
  PERIODIC REPORTS        MUNICIPAL
  PLAN IMPLEMENTATION     HISTORY
  PROJECT COSTS
  REHABILITATION
  RELOCATION
  RENEWAL AREAS
  OSMSA-0500
  230253685
  FREE TEXT SEGMENT 002
   ERIE, PA. REDEVELOPMENT AUTHORITY BD.
  FREE TEXT SEGMENT 015
   ANNUAL REPORT NO.13-1968
  FREE TEXT SEGMENT 021
   1968. 20P.
  FREE TEXT SEGMENT 097
   PA., ERIE
SUBJECT HEADINGS
     6BRENEWAL AREAS


OTOLERA69PS         ****************************************

SEARCHABLE SECTION
  =OTOLERA69PS
A CBD
C CITY SIZE-13
  DATES                   PUBLICATION  S54196900  ENTRY       S54196906
  GEO
  GLOSSARIES
  LOADING ZONES           INVENTORY
  PARKING
  PARKING FACILITIES
  REVENUES
  SPECIAL REPORTS
  TRAFFIC                 INVENTORY
  OSMSA-1730
  310484265
  FREE TEXT SEGMENT 002
   TOLEDO REGIONAL AREA PLAN FOR ACTION
  FREE TEXT SEGMENT 007
   PRESTON, E.S. AND ASSOCIATES
  FREE TEXT SEGMENT 011
   SURVEY OF PARKING SPACE USE IN THE TOLEDO REGIONAL AREA
  FREE TEXT SEGMENT 021
   MARCH 1969. 21P. 11 APPENDICES
  FREE TEXT SEGMENT 097
   OHIO, TOLEDO
SUBJECT HEADINGS
     6APARKING FACILITIES
     6BGLOSSARIES
     REPORTS ON LAW ENFORCEMENT BY REGIONAL AGENCIES


OATLAMA68ED          ****************************************

SEARCHABLE SECTION
B =OATLAMA68ED
  CITY SIZE-13
  COUNCILS OF GOVERNMENT
  DATA BANKS
  DATA PROCESSING
  DATES                     PUBLICATION  S54196800  ENTRY         S54196804
  GRAPHIC DISPLAYS
  INFORMATION SYSTEMS       NATIONAL                REGIONAL
  INTERGOVERNMENTAL RELAT   FEDERAL-CITY            FEDERAL-STAT
A LAW ENFORCEMENT
  QUESTIONNAIRES
  UPAP REPORT
  580440150
  FREE TEXT SEGMENT 002
   METROPOLITAN ATLANTA COUNCIL OF LOCAL GOVERNMENTS
  FREE TEXT SEGMENT 008
   NATIONAL CRIME INFORMATION CENTER
  FREE TEXT SEGMENT 011
   ELECTRONIC DATA PROCESSING BRIEF
  FREE TEXT SEGMENT 021
   1968. 14P.
  FREE TEXT SEGMENT 025
   GA. P-52
  FREE TEXT SEGMENT 097
   GA., ATLANTA
SUBJECT HEADINGS
      6ALAW ENFORCEMENT
      6BINFORMATION SYSTEMS

OBALTRP68PC          ****************************************

SEARCHABLE SECTION
B =OBALTRP68PC
  CITY SIZE-14
  DATES                     PUBLICATION  S54196800  ENTRY         S54196810
  EVALUATION
  GEO
  INTERLOCAL COOPERATION
A LAW ENFORCEMENT           REGIONAL
  METROPOLITAN AREAS
  POLICE PLANNING           REGIONAL
  REGIONAL PLANNING
  STATE AID
  TRAINING PROGRAMS
  UPAP REPORT
  OSMSA-0150
  520020000
  520030000
  520040025
  520070000
  520130000
  520140000
  FREE TEXT SEGMENT 002
   BALTIMORE. REGIONAL PLANNING COUNCIL
  FREE TEXT SEGMENT 006
   PUBLIC ADMINISTRATION SERVICE, CHICAGO
  FREE TEXT SEGMENT 011
   POLICE COOPERATIVE SERVICES IN THE BALTIMORE METROPOLITAN
   REPORTS ON LAW ENFORCEMENT BY REGIONAL AGENCIES

     AREA
  FREE TEXT SEGMENT 021
   1968. 39P
  FREE TEXT SEGMENT 023
     REPORT DESCRIBES A RECONNAISSANCE OF POLICE COOPERATION
   IN THE BALTIMORE REGION, AND RECOMMENDS THAT STAFF AND
   AUXILIARY SERVICES BE IMPROVED. COOPERATION HAS GREATEST
   POTENTIAL IN TRAINING, POLICE LABORTORY FACILITIES,
   COMMUNICATION AND INFORMATION EXCHANGE. REPORT URGES
   POLICE DEPARTMENTS BE REMOVED FROM THE RESPONSIBILITIES OF
   JAIL ADMINISTRATION AND FINDS A LACK OF FORMAL COOPER-
   ATION BETWEEN THE STATE POLICE AND COUNTY LAW ENFORCE-
   MENT AGENCIES. A RESIDENT TROOPER PLAN FOR STATE POLICE
   SERVICES TO SMALLER MUNICIPALITIES IS ENCOURAGED. THE
   PRESENT STATE-GRANT-IN-AID PROGRAM IS CRITIZED BECAUSE
   IT ENCOURAGES PROLIFERATION OF SMALL INADEQUATE POLICE
   DEPARTMENTS. REPORT CONCLUDES THAT THERE IS A REGIONAL
   LEVEL THAT MIGHT SERVE AS A BASIS FOR LAW ENFORCEMENT
   COOPERATION AND RECOMMENDS RPC INVOLVEMENT TO EVOLVE THIS.
  FREE TEXT SEGMENT 025
   MD. P-61
  FREE TEXT SEGMENT 097
   MD., BALTIMORE
SUBJECT HEADINGS
      6APOLICE PLANNING
      6BLAW ENFORCEMENT
      6CINTERLOCAL COOPERATION


OCALISA69RC        ****************************************

SEARCHABLE SECTION
B =OCALISA69RC
  APPLICATIONS
  COMPREHENSIVE PLANNING
  CORRECTIVE INSTITUTIONS
  COUNCILS OF GOVERNMENT
  DATA
  DATES                    PUBLICATION  S54196900  ENTRY        S54196903
  FEDERAL AID
  GEO
  GRANTS                   FEDERAL
  INTERAGENCY
A LAW ENFORCEMENT          REGIONAL
  PLAN REVIEWS
  POLICE PLANNING          REGIONAL
  PROCEDURES
  REGIONAL PLANNING
  SPECIAL REPORTS
  STAFF
  UPAP REPORT
  YOUTH
  OSMSA-0067
  OSMSA-0920
  OSMSA-1215
  OSMSA-1480
  930130000
  930190000
  930300000
  930330000
  930360000
  930560000
  FREE TEXT SEGMENT 002
   SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS
   SOUTHERN CALIFORNIA ASSN. OF GOVERNMENTS
```

```
     REPORTS ON LAW ENFORCEMENT BY REGIONAL AGENCIES

  FREE TEXT SEGMENT 007
   SOUTHERN CALIFORNIA UNIV. PUBLIC SYSTEMS RESEARCH
      INSTITUTE
  FREE TEXT SEGMENT 011
   ADVISORY PLANNING REVIEW, STATEMENT OF CRITERIA AND
      PROCEDURES
   COMPREHENSIVE PLAN FOR CRIMINAL JUSTICE, REGION 10
  FREE TEXT SEGMENT 021
   LOS ANGELES, 1969. 8P.
   MAR. 1969. 89P.
  FREE TEXT SEGMENT 031
   DEMONSTRATION CITIES AND METROPOLITAN DEVELOPMENT ACT OF
      1966. U.S.
  FREE TEXT SEGMENT 097
   CALIF.
SUBJECT HEADINGS
      6AAPPLICATIONS
      6BPROCEDURES
      6CPLAN REVIEWS
      6ALAW ENFORCEMENT
      6BPOLICE PLANNING


ODALLNC68LE         *****************************************

SEARCHABLE SECTION
B =ODALLNC68LE
  CITY SIZE-13
  CITY SIZE-14
  DATES                    PUBLICATION  S54196800  ENTRY        S54196808
  GEO
  INTERGOVERNMENTAL RELAT  FEDERAL-CITY            STATE-MUNICI
A LAW ENFORCEMENT          REGIONAL
  POLICE FACILITIES
  PUBLIC RELATIONS
  REPORTING
  TRAINING PROGRAMS
  UPAP REPORT
  OSMSA-0390
  OSMSA-0570
  740430000
  740571085
  740700000
  741260000
  741290000
  741840000
  742201500
  742490000
  FREE TEXT SEGMENT 002
   NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS
  FREE TEXT SEGMENT 011
   LAW ENFORCEMENT AND CRIMINAL JUSTICE FOR NORTH CENTRAL
      TEXAS, THROUGH INTERGOVERMENTAL COMMUNICATIONS, COOPER-
      ATION AND COORDINATION. REPORT FROM THE CITIZENS STUDY
      COMMITTEE FOR LAW ENFORCEMENT
  FREE TEXT SEGMENT 021
   ARLINGTON TEXAS., 1968. 110P. APPENDIX INCLUDES A SUMMARY
      OF THE NATIONAL CRIME COMMISSION REPORT
  FREE TEXT SEGMENT 023
   INTERGOVERNMENTAL COMMUNICATIONS, COOPERATION AND
   COORDINATION FOR LAW ENFORCEMENT.
  FREE TEXT SEGMENT 031
   LAW ENFORCEMENT AND CRIMINAL JUSTICE ACT OF 1967. U.S.
  FREE TEXT SEGMENT 097
   TEX., DALLAS
```

```
     REPORTS ON LAW ENFORCEMENT BY REGIONAL AGENCIES

SUBJECT HEADINGS
      6ATRAINING PROGRAMS
      6BLAW ENFORCEMENT


OTENNMC68LG        ****************************************

SEARCHABLE SECTION
  -MID-CUMBERLAND TENNESS
B =OTENNMC68LG
  COUNCILS OF GOVERNMENT
  COUNTY GOVERNMENT
  DATES                    PUBLICATION  S54196800  ENTRY        S54196901
  EVALUATION
  FIRE FACILITIES
  GEO
  HEALTH FACILITIES
  HIGHWAYS
A LAW ENFORCEMENT
  MUNICIPAL GOVERNMENT
  PARKS
  PUBLIC OFFICIALS         MUNICIPAL                RURAL
  PUBLIC SAFETY
  RECREATION
  SCHOOLS
  SEWERAGE
  STREETS
  SURVEYS
  TAX SHARING
  UPAP REPORT
  URBAN AFFAIRS
  WASTE MANAGEMENT
  WATER SYSTEMS
  OSMSA-1090
  620190000
  FREE TEXT SEGMENT 002
   MID-CUMBERLAND REGION COUNCIL OF GOVERNMENTS, TENN.
  FREE TEXT SEGMENT 005
   GRANT, DANIEL R.
  FREE TEXT SEGMENT 011
   LOCAL GOVERNMENT IN THE MID-CUMBERLAND REGION AS SEEN
      BY ITS ELECTED LAW MAKERS AND CHIEF EXECUTIVES
  FREE TEXT SEGMENT 021
   NASHVILLE, 1968. 62P.
  FREE TEXT SEGMENT 097
   TENN., MID-CUMBERLAND REG
 SUBJECT HEADINGS
      6AMUNICIPAL GOVERNMENT
      6BCOUNTY GOVERNMENT
      6CCOUNCILS OF GOVERNMENT
      6DEVALUATION
     POPULATION CHARACTERISTICS IN METROPOLITAN INDIANAPOLIS


LINDIMAMP69MS       *****************************************

SEARCHABLE SECTION
  =LINDIMAMP69MS
  BUILDING CONDITIONS
  CAPITAL IMPROVEMENTS
  CITY SIZE-13
  COMMUNITY FACILITIES     INVENTORY
  COMMUNITY PLANNING
  COSTING
  DATES                    PUBLICATION  S54196900  ENTRY        S54196905
                           CONTENT      U54198500  CONTENT      L54196800
  GEO
  GOALS
  MAPS
  PLAN IMPLEMENTATION
  PLANNING UNIT
A POPULATION CHARACTERIST
  UPAP REPORT
B OSMSA-0720
  320490000
  320491145
  FREE TEXT SEGMENT 002
   MARION CO., INC. METROPOLITAN PLANNING DEPT.
  FREE TEXT SEGMENT 011
   METROPOLITAN SUBAREA PLAN, HIGHLAND BROOKSIDE
  FREE TEXT SEGMENT 021
   INDIANAPOLIS, JAN., 1969. 234P.
  FREE TEXT SEGMENT 023
      HISTORY AND DEVELOPMENT OF HIGHLAND-BROOKSIDE SUB-AREA.
   EXAMINES EXISTING CONDITIONS, ENVIRONMENTAL PROBLEMS AND
   RESOURCES IN COMMUNITY, AND DETERMINES GOALS AND OBJECTIVE
   FOR THE AREA, AS WELL AS STATING DEVELOPMENT PRINCIPLES
   AND CONCEPTS. PROPOSALS ARE DETAILED FOR SUB-AREA TO 1985.
  FREE TEXT SEGMENT 025
   IND. P-45
  FREE TEXT SEGMENT 056
    CFSTI
  FREE TEXT SEGMENT 097
    INC., INDIANAPOLIS
SUBJECT HEADINGS
      6APLAN IMPLEMENTATION
      6BCOMMUNITY PLANNING
    ROLE OF EASEMENTS IN HISTORIC PRESERVATION


BASPOPA69MRCH      *****************************************

SEARCHABLE SECTION
  =BASPOPA69MRCH
  BIBLIOGRAPHY
  CHECKLISTS
  DATES                   PUBLICATION  S54196900  ENTRY        S54196905
A EASEMENTS
  EVALUATION
B HISTORIC PRESERVATION
  HISTORIC SITES
  HISTORICAL DEVELOPMENT
  PLAN IMPLEMENTATION
  SPECIAL DISTRICTS
  SPECIAL REPORTS
  TAX INCENTIVES
  FREE TEXT SEGMENT 002
   ASPO PLANNING ADVISORY SERVICE
  FREE TEXT SEGMENT 005
   MINER, RALPH W.
  FREE TEXT SEGMENT 011
   CONSERVATION OF HISTORIC AND CULTURAL RESOURCES
  FREE TEXT SEGMENT 021
   CHICAGO. 56P. REPT. 244. MAR.69
  FREE TEXT SEGMENT 056
    1313 E. 60TH ST., CHICAGO, ILL. 60637
 SUBJECT HEADINGS
      6AHISTORIC PRESERVATION
      6BHISTORIC SITES
      6CPLAN IMPLEMENTATION
      6DBIBLIOGRAPHY
    MEASURES FOR ENVIRONMENTAL PROTECTION OUTSIDE THE U.S.


TUKMHLG69RM        ****************************************

SEARCHABLE SECTION
B -F/UNITED KINGDOM.
  =TURKMHLG69RM
  CONSERVATION
  DATES                    PUBLICATION  S84196900  ENTRY       S54196907
                           CONTENT      U54196800  CONTENT     L54196700
A ENVIRONMENTAL PROTECTIO
  FINANCIAL ASSISTANCE
  GEO
  HISTORIC PRESERVATION
  HOUSING
  HOUSING ECONOMICS
  HOUSING PROGRAMS
  HOUSING STOCK            PUBLIC                  PRIVATE
  INTERGOVERNMENTAL RELAT
  LAND USE
  LAND USE CONTROLS
  LEGISLATION              NATIONAL
  METROPOLITAN AREA PLAN
  MUNICIPAL FINANCE
  MUNICIPAL GOVERNMENT
  NEW TOWNS
  OUTDOOR RECREATION
  PARKS
  PLANNING ADMINISTRATION
  REGIONAL PLANNING
  REHABILITATION
  SPECIAL REPORTS
  WATER RESOURCES
  FREE TEXT SEGMENT 002
   U.K. HOUSING AND LOCAL GOVERNMENT MINISTRY
  FREE TEXT SEGMENT 011
   REPORT OF THE MINISTRY OF HOUSING AND LOCAL GOVERNMEN
      1967 AND 1968
  FREE TEXT SEGMENT 021
   HMSO. 1969. 126P.
  FREE TEXT SEGMENT 031
   U.K. TOWN AND COUNTRY PLANNING ACT OF 1968.
   U.K. COUNTRYSIDE ACT OF 1968.
   U.K. CLEAN AIR ACT OF 1968.
  FREE TEXT SEGMENT 097
   U.K.
SUBJECT HEADINGS
      6AHOUSING
      6BPLANNING ADMINISTRATION
      6CLAND USE
      6DOUTDOOR RECREATION
      6ENEW TOWNS
      6FMUNICIPAL GOVERNMENT
```

## POVERTY PROGRAMS OR SOCIAL SERVICES IN A MODEL CITY PROGRAM

```
DNATCUP68HC137     ****************************************

SEARCHABLE SECTION
  =DNATCUP68HD137
  CITY SIZE-13
  DATES                      PUBLICATION  S54196800  ENTRY        S54196811
  EVICTION
  EXTENSION SERVICES
  GEO
  HEARINGS
  HOUSING PROGRAMS
A MODEL CITIES PROGRAM
B POVERTY PROGRAMS
  590130000
  590131370
  FREE TEXT SEGMENT 001
   MONCUR, SAMUEL
  FREE TEXT SEGMENT 005
   VIRRICK, ELIZABETH
   GREEN, JEROME
  FREE TEXT SEGMENT 006
   ECONOMIC OPPORTUNITIES PROGRAM, NEIGHBORHOOD CENTERS,
      DADE CO., FLA.
  FREE TEXT SEGMENT 011
   HOME MANAGEMENT EDUCATIONAL SERVICE, HALFWAY HOUSE FOR
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   FREE TEXT SEGMENT 011
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    1969. 24P.
   FREE TEXT SEGMENT 023
        MAGAZINE FORMAT REPORT ON ACTION PROGRAMS RECOMMENDED
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   FREE TEXT SEGMENT 097
    MD., BALTIMORE
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```

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     POVERTY PROGRAMS OR SOCIAL SERVICES IN A MODEL CITY PROGRAM

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      6BPRIVATE SECTOR
      6CTECHNICAL ASSISTANCE
      6DMODEL NEIGHBORHOODS

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  FEDERAL POLICY
  LAND RESOURCES
A MODEL CITIES PROGRAM
B POVERTY PROGRAMS
  PROGRAM STANDARDS
  SOCIAL PLANNING
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       6BSOCIAL PLANNING
       6CECONOMIC PLANNING

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  ARTICLES
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  CITY SIZE-14
  CITY SIZE-15
  COMPREHENSIVE PLANNING
  DATES                     PUBLICATION  S54196900  ENTRY        S54196903
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  GEO
  GHETTOS
A MODEL CITIES PROGRAM
  NEGROES
B POVERTY PROGRAMS
  RACE RELATIONS            INSTITUTIONA            PERSONAL
  RENEWAL
  OSMSA-0210
  OSMSA-0320
  OSMSA-1800
  140130220
  330161051
  530010005
  FREE TEXT SEGMENT 001
   STAFFORD, WALTER W.
  FREE TEXT SEGMENT 005
   LADNER, JOYCE
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   COMPREHENSIVE PLANNING AND RACISM
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YJOHO-A68MFMC       *****************************************

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  HEARINGS
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  HOUSING THE ELDERLY
  HUD
A MODEL CITIES PROGRAM
  NEIGHBORHOOD SERVICE CE
  OEO
C SOCIAL SERVICES
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   MOSS, FRANK E.
  FREE TEXT SEGMENT 006
   SENATE. SPECIAL COMMITTEE ON AGING. 1968
  FREE TEXT SEGMENT 009
   NATIONAL COUNCIL ON AGING, PROJECT FIND
  FREE TEXT SEGMENT 011
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      FOR THE AGED
  FREE TEXT SEGMENT 021
   JOHO. 25-508-511. 11-68.
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      6BHOUSING THE ELDERLY
      6CHEARINGS
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# APPENDIX B / PROTOTYPE INPUT INDEX

A publication of Project URBANDOC
at The City University of New York 33 West 42 Street, New York, N.Y. 10036

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## Introduction

### Purpose

The URBANDOC *Input Index* constitutes the publications aspect of computerized bibliographic services for subject specialists associated with urban renewal. The publications program responded to a long-experessed need in the planning profession for a specialized index journal. The bibliographic data base of the URBANDOC system is used to produce author, subject and various other citations to the urban renewal literature.

By its design the *Input Index* can be termed an information retrieval tool. Although the term "information retrieval" usually implies computer searching, many inquiries can be handled equally well by manual means. The *Input Index* format provides for both manual search and browsing activity by the user. For manual searching, the *Index* offers capabilities in urban affairs comparable to those index journals provided by other information systems for medicine, the "hard" sciences, and education. The browsing advantages of hard-copy bibliographic products are obvious, particularly when used both as an "announcement" journal and an index. It is in this framework that URBANDOC urges its own *Index* be evaluated as both a stand-alone product as well as one associated with a larger system.

### Scope

This prototype edition presents information on 144 monographs, reports and periodical articles chosen from materials received at URBANDOC in late-spring and early-summer of 1969. Although not a scientific sampling of the literature of the time period, they typify documents which URBANDOC is planning audiences found useful in previous field-test issues of the *Index.*

The majority of publications included in this and previous field-test issues originated in government. Subnational agency reports have been given particular attention since they are the most difficult to locate by conventional means. On the national level, United States, Canadian and United Kingdom sources are represented throughout the document base. English-language reports from provinces and cities and international agencies have been included in the past; they do not appear in the prototype edition for reasons of economy.

Nongovernmental sources represented include the professional societies, universities, independent research entities, local civic groups and trade publishers. Consultants, unless writing on their own behalf, have their reports listed under the contracting agencies. (Criteria adopted by the Project for identification and treatment of personal authors and individuals associated with preparation of documents is elaborated upon in the URBANDOC *General Manual.* Inclusion of the Consultant Index in the prototype edition is an example of the versatility of bibliographic data expansion possible in the URBANDOC system.)

Subject matter was as important as origin in choosing the documents. The Major Subject Listing is a representative sample of the subject headings available. A separate volume, entitled URBANDOC *Thesaurus,* lists all the possible terms for subject analysis and also indicates the scope notes and cross-references for the subject headings used in the prototype.

### Format

The format of the prototype edition results from user comments and suggestions of earlier field-test issues of the *Input Index.* The prototype also represents a compromise between all the wishes of the potential users and economic limitations. The actual format of the edition and instructions on its use are described in the following pages.

The *Input Index* follows the "double look-up" format that has been adopted as a general convention for most indexes produced by new non-conventional bibliographic systems. Advantages of the format are multiple access points, significant bibliographic data presented in arrangements that permit rapid scanning and elimination of repeated data which would increase the physical bulkiness of an index.

In this issue, the reader may first consult either the Major Subject Listing, the Main Document Listing or one of seven specialized indexes. If the Major Subject Listing or a special listing is used for the first look-up, the reader must perform a second look-up in the Main Document Listing for more detailed bibliographic information about the item, hence the name "double look-up." Regardless of which is used, the document identification number is supplied as part of the citation as the reference "key" to find the item in the Main Document Listing.

*Major Subject Listing:* Most users prefer this section of the Input Index as the first access point for information about the literature. Entry citations in this section contain two elements of bibliographic interest and appear as follows:

Subject Main author (corporate or personal)
    Title
        Document number

*Main Document Listing:* The most detailed bibliographic information about a document appears in the pages which comprise this section of the *Index.* Entries are arranged alphabetically by document number, the first character of which also indicates the broad classification given to the document. Each entry includes the data in the following arrangement:

Document No. Main author (corporate or personal)
    Title
        Imprint and collation
            Abstract (for Urban Planning Assistance Program Reports)
            Acquisition information (when available)
    Subject Headings

*Special Listings:* Entries in these indexes are arranged alphabetically. Personal names are inverted.

*URBANDOC Classification Scheme:* A broad classification system was established to catagorize the documents, chiefly by the type of institution issuing them. Letters of the alphabet are used and are included also as part of the document number. The total schedule consists of eighteen classes, eleven of which were used in this edition of the *Index*. They are:

| | |
|---|---|
| A | General books and monographs including trade books and university press publishers; foundation and independent research organization publications |
| B | Professional society and national association publications |
| C | Academic institution publications |
| D | Federal executive department documents |
| G | State executive department documents |
| K | Municipal and local documents |
| L | County documents |
| O | Metropolitan area, regional documents |
| P | Subnational public interest group publications |
| U | Non-U.S. national documents |
| Y | Periodical articles |

*Document Number:* The alphanumeric identification assigned to a document is used for physical storage of the document as well as its bibliographic record stored in the computer system. While it is always unique, the number is also meaningful in the URBANDOC system and thus unlike a strict accession number. The first character of the number is the class series letter (see above). Other characters in the number derive from the name of the main entry (author or issuing agency), year of publication and title. The following example illustrates the formulation of a typical sub-national government document number:

GNEWJCA69AG

G = Class series letter, i.e. State executive department
NEWJ = State code, i.e. New Jersey
CA = Author (agency) initials, i.e. Community Affairs Dept.
69 = Year of publication
AG = Significant initials of title, i.e. "Administrative Guide to Subdivision Regulations"

**Coden Index to Periodical Titles**

In the Y class, URBANDOC uses the "CODEN for Periodical titles" schedule in formulating document numbers and in the imprint and collation of the bibliographic record. The CODEN is a six character code established for over 40,000 periodical titles in a wide variety of disciplines as a means of unique identification. When a CODEN has not been established for a title, the Project procures one from The Franklin Institute Research Laboratories, Science Information Services (responsible for assigning these identifiers), thus assuring conformity with national and international usage.

Example of CODEN use in the imprint and collation:

| | | | |
|---|---|---|---|
| "HORV-A. | 19 | 16-18 | May 69." |
| (CODEN for *Housing Review)* | (Vol.) | (Pages) | (date of issue) |

| *Document Notation* | *CODEN* | *Periodical Title and Publication Address* |
|---|---|---|
| Y | ACGU–A | American County Government<br>100 Connecticut Ave., N.W., Washington, D.C. 20036 |
| Y | ACUF–A | Architectural Forum<br>111 W. 57th St., New York, N.Y. 10019 |
| Y | AIDJ–B | A.I.D.C. Journal (American Industrial Development Council)<br>230 Boylston St., Boston, Mass. 02116 |
| Y | AIPJ–A | Journal of American Institute of Planners<br>917 15th St. N.W., Washington D.C. 20005 |
| Y | APPJ–A | Appraisal Journal<br>155 E. Superior St., Chicago, Ill. 60611 |
| Y | ASTA–A | American Statistician<br>810 18th St. N.W., Washington, D.C. 20006 |
| Y | ATER–A | Atlanta Economic Review<br>33 Gilmore St. S.E., Atlanta, Ga. 30303 |
| Y | BLDG–A | Buildings<br>427 6th Ave. S.E., Cedar Rapids, Ia. 52406 |
| Y | BLIN–B | Build International<br>Weena 700, Rotterdam, Netherlands |
| Y | CHSU–A | Chartered Surveyor<br>12 Great George St., Parliament Sq., London SW1, England |
| Y | CITY–A | City<br>1717 Massachusetts Ave. N.W., Washington, D.C. 20036 |
| Y | EKIS–A | Ekistics<br>24 Strat. Syndesmou St., Athens, Greece |
| Y | FORT–A | Fortune<br>Time-Life Bldg., Rockefeller Center, New York, N.Y.10020 |
| Y | HISP–A | Historic Preservation<br>748 Jackson Pl. N.W., Washington, D.C. 20006 |
| Y | HORV–A | Housing Review<br>13 Suffolk St., Pall Mall East, London W1, England |
| Y | JOHO–A | Journal of Housing<br>2600 Virginia Ave., Washington, D.C. 20037 |
| Y | JPCA–A | Air Pollution Control Association Journal<br>4400 5th Ave., Pittsburgh, Pa. 15213 |
| Y | LAEC–A | Land Economics<br>Box 1379, Madison, Wis. 53701 |

| | | |
|---|---|---|
| Y | LAUC–A | Land-Use Controls Quarterly<br>1313 E. 60th St., Chicago, Ill. 60637 |
| Y | LSAR–A | Landscape Architecture<br>1500 Bardtown Rd., Louisville, Ky. 40205 |
| Y | MTPO–A | Metropolitan<br>1155 Waukegan Rd., Glenview, Ill. 60025 |
| Y | NACI–B | Nation's Cities<br>1612 K St. N.W., Washington, D.C. 20006 |
| Y | NCIR–A | National Civic Review<br>47 E. 68th St., New York, N.Y. 10021 |
| Y | ONHO–A | Ontario Housing<br>188 University Ave., Toronto, Canada |
| Y | PBAR–B | Public Administration Review<br>1225 Connecticut Ave. N.W., Washington, D.C. 20036 |
| Y | SGOV–A | State Government<br>1313 E. 60th St., Chicago, Ill. 60637 |
| Y | SPLB–A | Special Libraries<br>235 Park Ave. So., New York, N.Y. 10003 |
| Y | THNK–A | Think<br>International Business Machines Corp., Armonk, N.Y. 10504 |
| Y | TPIN–A | Town Planning Institute Journal<br>26 Portland Pl., London W1, England |
| Y | TRAQ–A | Traffic Quarterly<br>Eno Foundation for Transportation, Inc., Saugatuck, Conn. |
| Y | URRE–A | Urban Review<br>105 Madison Ave., New York, N.Y. 10016 |

* * * *

**Non-Coden Serials**

| | | |
|---|---|---|
| A | DOWNSS | Downtown Idea Exchange. Special Study<br>125 E. 23rd St., New York, N.Y. 10010 |
| A | DOWNRB | Downtown Renewal Bulletin<br>125 E. 23rd St., New York, N.Y. 10010 |

## MAJCR SUBJECT LISTING

| | |
|---|---|
| ACCESS | SANDC, LAURENCE<br>HIGHWAY LAND ACQUISITION IN THE UNITEC STATES<br>YAPPJ-A69LSHL |
| ACTION PRCGRAMS | MILLER, KENNETH H.<br>COMMUNITY CRGANIZATIONS IN THE GHETTO<br>CHARVPT69SI105 |
| ADVOCACY PLANNING | METROPOLITAN COMMITTEE ON PLANNING, NEW YORK<br>DEMAND FOR PLANNING SERVICES BY LCCAL COMMUNITIES<br>PNEWYMP69DP |
| AGRICULTURE | PUERTC RICO. PLANNING BD.<br>PRESERVATICN OF AGRICULTURAL LAND IN PUERTC RICO<br>GPUERPB68PA |
| AIR PCLLUTION | GORSCHBOTH, FREDERICK F.<br>CONTROLLING AIR POLLUTICN<br>YNACI-B69GFCA |
| AIRPORT PLANNING | ALEXANDER, DONALC G.<br>IMPROVING CUR NATIONAL AIRPCRT SYSTEM<br>YNACI-B69ADIN |
| AIRPORTS | SIBERT, ERIC<br>AIRCRAFT NCISE AND DEVELOPMENT CONTROL<br>YTPIN-A69SEAN |
| APARTMENTS | NEW YCRK. CITY. HOUSING AND CEVELOPMENT ADMIN.<br>LCWER EAST SIDE HOUSING INVENTORY 1960-1968<br>KNEWYHD..69LE |
| ARCHITECTURAL FEATURES | BACK BAY ARCHITECTURAL COMMISSION, BCSTON<br>BACK BAY RESIDENTIAL DISTRICT GUIDELINES FCR EXTERIOR REHABILITATICN AND RESTCRATION<br>PBOSTBB69BB |
| ARTISTS QUARTERS | BERRY, BRIAN, J.L.<br>HYCE PARK-KENWCCD CASE<br>CCHICUS68IU1C1 |
| BEAUTIFICATICN | DOWNTCWN ICEA EXCHANGE. SPECIAL STUDY<br>URBAN BEAUTIFICATION MEMO NC. 2.<br>ACDWNSS69..UBB |
| BIBLICGRAPHY | ASPO PLANNING ADVISORY SERVICE<br>CCNSERVATICN CF HISTORIC ANC CULTURAL RESCURCES<br>BASPOPA69MRCH |
| BIBLICGRAPHY | COUNCIL CF PLANNING LIBRARIANS. EXCHANGE BIBLIOGRAPHY<br>INTERCISCIPLINARY APPROACH TO REGICNAL PLANNING<br>BCOPLEB69FJIR |
| BIBLIOGRAPHY | COUNCIL OF PLANNING LIBRARIANS. EXCHANGE BIBLIOGRAPHY<br>CITIZEN PARTICIPATICN IN PLANNING<br>BCOPLEB69LJCP |
| BIBLICGRAPHY | OUTDCCR RECREATICN BUR.<br>INDEX OF SELECTED OUTDCOR RECREATION LITERATURE<br>DOUTDRB69IS |
| BIBLICGRAPHY | U.K. PUBLIC BUILDING AND WORKS MINISTRY. BUILDING RESEARCH STATICN<br>BUILCING<br>TUKPWBR69B. |

## MAJOR SUBJECT LISTING

| | |
|---|---|
| BLIGHT | MARION CO., IND. METROPOLITAN PLANNING DEPT.<br>HOUSING AND URBAN RENEWAL -1<br>LINDIMAPP68HUA |
| BUDGETS | NATIONAL ASSN. OF STATE BUDGET OFFICERS<br>BUDGETS FOR STATE PLANNING<br>BNASBO.69BS |
| BUILDING CODES | NATIONAL COMMISSION ON URBAN PROBLEMS<br>CODES AND STANDARDS<br>DNATCUP68BA103 |
| BUILDING INDUSTRY | NATIONAL COMMISSION ON URBAN PROBLEMS<br>REDUCING HOUSING COSTS<br>DNATCUP68BA105 |
| BUILDING INDUSTRY | SITTIG, J.<br>QUALITY IN BUILDING<br>YBLIN-B69SJQB |
| BUILDING TECHNOLOGY | INSTITUTE FOR DEFENSE ANALYSES. PROGRAM ANALYSIS DIV.<br>COST-REDUCING CONDOMINIUM SYSTEMS FOR LOW COST ROOMS<br>AINSTDA68CR |
| BUILDING TECHNOLOGY | NATIONAL COMMISSION ON URBAN PROBLEMS<br>REDUCING HOUSING COSTS<br>DNATCUP68BA105 |
| BUILDING TECHNOLOGY | MILLER, DAVID S.<br>SYSTEMS BUILDING<br>YBLDG-A69MDSB |
| BUILDING TECHNOLOGY | KARLEN, INGVAR<br>QUALITY, PHILOSOPHY AND ASSESSMENT IN SWEDEN<br>YBLIN-B69KIQP |
| BUILDING TRADES | NATIONAL COMMISSION ON URBAN PROBLEMS<br>REDUCING HOUSING COSTS<br>DNATCUP68BA105 |
| BUILDINGS | U.K. PUBLIC BUILDING AND WORKS MINISTRY. BUILDING RESEARCH STATION<br>BUILDING<br>TUKPWBR69B. |
| BUILDINGS | NATIONAL SWEDISH INSTITUTE FOR BUILDING RESEARCH<br>FLEXIBLE DWELLINGS HAVE MANY ADVANTAGES<br>YBLIN-B69NSFD |
| CAPITAL BUDGETS | CORAL GABLES, FLA. CITY COMMISSION<br>PLAN IMPLEMENTATION FOR THE COMPREHENSIVE DEVELOPMENT PLAN, CORAL GABLES, FLORIDA<br>KFLCRCGCC69PI |
| CAPITAL BUDGETS | NEW YORK. CITY. CITY PLANNING COMMISSION<br>NEW YORK CITY PUBLIC LIBRARIES. A NEW LOOK AND PROPOSED BUDGETING PRIORITIES.<br>KNEWYCP..68NY |
| CAPITAL IMPROVEMENTS | ATLANTA REGION METROPOLITAN PLANNING COMMISSION<br>STEPS TOWARD DECISION<br>OATLAMP69ST |
| CAPITAL IMPROVEMENTS | SOUTHEASTERN CONNECTICUT REGIONAL PLANNING AGENCY<br>CONTINUED |

## MAJOR SUBJECT LISTING

```
CAPITAL IMPROVEMENTS         CONTINUED
                                RECOMMENDED REGIONAL SEWERAGE PLAN
                                      OCONNSR69RR

CASE STUDIES                 WOLF, ELEANOR PAPERNO
                                CHANGE AND RENEWAL IN AN URBAN COMMUNITY; FIVE CASE
                                   STUDIES OF DETROIT
                                      AWOLFEP69CR

CASE STUDIES                 AMERICAN COUNTY GOVERNMENT
                                SOLID WASTE MANAGEMENT, PLANNING
                                      YACGU-A69..SW

CBD                          DOWNTOWN IDEA EXCHANGE. SPECIAL STUDY
                                URBAN BEAUTIFICATION MEMO NO. 2.
                                      ADOWNSS69..UBB

CENSUS                       CITRO, CONSTANCE F.
                                CENSUS BUREAU AS AN INFORMATION SYSTEM
                                      YSPLB-A69CCCB

CENTRAL CITY                 NATIONAL COMMISSION ON URBAN PROBLEMS
                                URBAN SETTING. POPULATION, POVERTY, RACE
                                      DNATCUP68BA101

CENTRAL CITY                 MORRIS, ROBERT L.
                                IMPACT OF NEW TOWNS, PART 1
                                      YNACI-B69MRIN

CENTRES                      REGIONAL PLAN ASSN., NEW YORK
                                FUTURE OF BERGEN AND PASSAIC COUNTIES
                                      ONEWYRP69FB

CENTRES                      REGIONAL PLAN ASSN., NEW YORK
                                FUTURE OF ORANGE COUNTY
                                      ONEWYRP69FO

CHILD CARE                   PLATT, JOHN R.
                                CHILD CARE COMMUNITIES-UNITS FOR BETTER URBAN LIVING
                                      YURRE-A69PJCC

CHILDREN                     BERKELEY, ELLEN PERRY
                                ENVIRONMENTAL EDUCATION FROM KINDERGARDEN ON UP
                                      YACUF-A69BEEE

CIRCULATION PLANS            MIAMI URBAN AREA TRANSPORTATION STUDY
                                PROPOSED TRANSPORTATION MASTER PLAN FOR DADE COUNTY
                                      OMIAMUA69PT

CITIZEN PARTICIPATION        COUNCIL OF PLANNING LIBRARIANS. EXCHANGE BIBLIOGRAPHY
                                CITIZEN PARTICIPATION IN PLANNING
                                      BCOPLEB69LJCP

CITIZEN PARTICIPATION        JOURNAL OF HOUSING
                                CITIZEN PARTICIPATION IN PLANNING
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| CLIMATE | COUNCIL OF PLANNING LIBRARIANS. EXCHANGE BIBLIOGRAPHY<br>INTERDISCIPLINARY APPROACH TO REGIONAL PLANNING<br>BCOPLEB69FJIR |
| CODING | SAN DIEGO CO. COMPREHENSIVE PLANNING ORGANIZATION<br>STANDARD LAND USE CODE-SAN DIEGO REGION<br>OSANDCC68UL |
| COLLEGE HOUSING | ONTARIO HOUSING<br>STUDENT HOUSING ACROSS ONTARIO<br>YCNHC-A69..SH |
| COLLEGES, UNIVERSITIES | TEXAS A AND M UNIV.<br>DEFINITION OF THE ROLE OF THE UNIVERSITIES IN THE SOLUTION OF URBAN PROBLEMS<br>CTEXAAM69DR |
| COLLEGES, UNIVERSITIES | NEW YORK. STATE. OFFICE OF PLANNING COORDINATION<br>BUFFALO-AMHERST CORRIDOR TECHNICAL REPORT<br>GNEWYPC69BA |
| COMMUNITY DEVELOPMENT | MARRIS, ROBIN<br>BUSINESS, ECONOMICS AND SOCIETY<br>CHARVPT69SI102 |
| COMMUNITY FACILITIES PLANS | NEW YORK. CITY. MODEL CITIES-CENTRAL BROOKLYN<br>BROWNSVILLE PHYSICAL REDEVELOPMENT PLAN, A REPORT TO THE PEOPLE<br>KNEWYMCCB69BP |
| COMMUNITY IMPROVEMENT | WARNER ROBINS, GA. PLANNING COMMISSION<br>NEI[illegible]BORHOOD ANALYSES, WARNER ROBINS, GA.<br>KGECRWRPC69NA |
| COMMUNITY ORGANIZATIONS | MILLER, KENNETH H.<br>COMMUNITY ORGANIZATIONS IN THE GHETTO<br>CHARVPT69SI105 |
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| COMMUNITY PLANNING | LEVIN, MELVIN R.<br>COMMUNITY AND REGIONAL PLANNING, ISSUES IN PUBLIC POLICY<br>ALEVIMR69CR |
| COMMUNITY PLANNING | MARION CO., IND. METROPOLITAN PLANNING DEPT.<br>METROPOLITAN SUBAREA PLAN, HIGHLAND BROOKSIDE<br>LINDIMAMP69MS |
| COMMUNITY PLANNING | METROPOLITAN COMMITTEE ON PLANNING, NEW YORK<br>DEMAND FOR PLANNING SERVICES BY LOCAL COMMUNITIES<br>PNEWYMP69DP |
| COMMUNITY RELATIONS | MIAMI. UNIV. CENTER FOR ADVANCED INTERNATIONAL STUDIES<br>PSYCHO-SOCIAL DYNAMICS IN MIAMI<br>CMIAMCA69PS |
| COMPACTS | ZIMMERMANN, FREDERICK L.<br>WORKING AGREEMENT<br>YNCIR-A69ZFWA |
| COMPACTS | ZIMMERMANN, FREDERICK L.<br>INTERGOVERNMENTAL COMMISSIONS, THE INTERSTATE FEDERAL |

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| DATA | ALEXANDER, LAURENCE A.<br>WHO THINKS FOR THE THINK TANK<br>ADOWNRB69ALWT |
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| DATA BANKS | MARON, M.E.<br>LARGE SCALE DATA BANKS<br>YSPLB-A69MMDB |
| DATA SOURCES | WHITE, BRENDA<br>INFORMATION FOR PLANNING<br>AWHITB.69IP |
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| DEMONSTRATIONS | STANFORD RESEARCH INSTITUTE<br>TRANSPORTATION EFFECTS ON THE NATIONAL ALLIANCE OF BUSINESSMEN PROGRAM<br>ASTANRI69TE |
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| DEVELOPERS | WALTERS, JOE P.<br>PLANNED RESEARCH AND DEVELOPMENT DISTRICTS<br>YAIDJ-B69WJPR |
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| DEVELOPMENT CORPORATIONS | OBLOCK, ROBERT<br>LOW INCOME HOUSING<br>CHARVPT69SI106 |
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| DEVELOPMENT PLANS | NEW YORK. CITY. MODEL CITIES-CENTRAL BROOKLYN<br>PHASE 2 PLAN, EAST NEW YORK MODEL CITIES<br>KNEWYMCCB69PP |
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| ENVIRONMENTAL PROTECTION | JOURNAL OF THE AIR POLLUTION CONTROL ASSN.<br>1968 STATE LEGISLATION FOR POLLUTION CONTROL<br>YJPCA-A69..SL |
| EQUAL OPPORTUNITIES | HAMPDEN-TURNER, CHARLES<br>BLACK POWER. A BLUEPRINT FOR PSYCHO-SOCIAL DEVELOPMENT<br>CHARVPT69SI104 |
| EXPENDITURES | TAX FOUNDATION, INC.<br>FACTS AND FIGURES ON GOVERNMENT FINANCE<br>ATAX.F.69FF |
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                                POVERTY, PLANNING AND POLITICS IN THE NEW BOSTON. ORIGINS
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| HANDICAPPED | CORNELL, RALPH D.<br>GARDENS FOR THE BLIND, ITS WHAT YOU DO NOT SEE THAT COUNTS<br>YLSAR-A69CRGB |
| HEALTH FACILITIES | U.K. PUBLIC BUILDING AND WORKS MINISTRY. BUILDING RESEARCH STATION<br>BUILDING<br>TUKPWBR69B. |
| HEALTH PLANNING | NATIONAL ASSN. OF STATE BUDGET OFFICERS<br>STATE BUDGETING FOR COMPREHENSIVE HEALTH SERVICE PLANNING<br>BNASBO.68SP |
| HIGHWAYS | U.K. PUBLIC BUILDING AND WORKS MINISTRY. BUILDING RESEARCH STATION<br>BUILDING<br>TUKPWBR69B. |
| HIGHWAYS | MOREHOUSE, THOMAS A.<br>THE 1962 HIGHWAY ACT, A STUDY IN ARTFUL INTERPRETATION<br>YAIPJ-A69MTHA |
| HIGHWAYS | SANDO, LAURENCE<br>HIGHWAY LAND ACQUISITION IN THE UNITED STATES<br>YAPPJ-A69LSHL |
| HISTORIC PRESERVATION | ASPO PLANNING ADVISORY SERVICE<br>CONSERVATION OF HISTORIC AND CULTURAL RESOURCES<br>BASPCPA69MRCH |
| HISTORIC PRESERVATION | BACK BAY ARCHITECTURAL COMMISSION, BOSTON<br>BACK BAY RESIDENTIAL DISTRICT GUIDELINES FOR EXTERIOR REHABILITATION AND RESTORATION<br>PBOSTBB69BB |
| HISTORIC SITES | ASPO PLANNING ADVISORY SERVICE<br>CONSERVATION OF HISTORIC AND CULTURAL RESOURCES<br>BASPOPA69MRCH |
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| HOUSING DEMAND | NATIONAL COMMISSION ON URBAN PROBLEMS<br>BUILDING THE AMERICAN CITY. REPORT OF THE NATIONAL COMMISSION ON URBAN PROBLEMS TO THE CONGRESS AND TO THE PRESIDENT OF THE UNITED STATES.<br>DNATCUP68BA |
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| HOUSING ECONOMICS | NATIONAL COMMISSION ON URBAN PROBLEMS<br>BUILDING THE AMERICAN CITY. REPORT OF THE NATIONAL COMMISSION ON URBAN PROBLEMS TO THE CONGRESS AND TO THE PRESIDENT OF THE UNITED STATES.<br>DNATCUP68BA |
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| HOUSING PROGRAMS | NASSAU-SUFFOLK CO., N.Y. REGIONAL PLANNING BD.<br>HOUSING, BETTER HOMES FOR BETTER COMMUNITIES<br>CNEWYNS68HB |
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| HOUSING STARTS | CANADA. CENTRAL MORTGAGE AND HOUSING CORP. ECONOMICS AND STATISTICS DIV.<br>CANADIAN HOUSING STATISTICS 1968<br>TCENTMH69CS |
| HOUSING STOCK | NEW YORK. CITY. HOUSING AND DEVELOPMENT ADMIN.<br>LOWER EAST SIDE HOUSING INVENTORY 1960-1968<br>KNEWYHD..69LE |
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                                 HCW WOULD REVENUE SHARING WORK
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                                       YASTA-A69CACS

JOURNEY TO WORK               STANFCRD RESEARCH INSTITUTE
                                 TRANSPORTATION EFFECTS CN THE NATIONAL ALLIANCE OF
                                    BUSINESSMEN PROGRAM
                                       ASTANRI69TE

LAND ACQUISITION              METROPOLITAN COUNCIL CF THE TWIN CITIES AREA, SAINT PAUL
                                 METROPOLITAN CPEN SPACE SYSTEM
                                       OSTPLMC69MO

LAND ACQUISITION              SANDC, LAURENCE
                                 HIGHWAY LAND ACQUISITION IN THE UNITED STATES
                              CONTINUEC
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## MAJOR SUBJECT LISTING

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| LAND ACQUISITION | CONTINUED<br>YAPPJ-A69LSHL |
| LAND ECONOMICS | INSTITUTE FOR DEFENSE ANALYSES. PROGRAM ANALYSIS DIV.<br>LAND AS AN ELEMENT OF HOUSING COSTS.<br>AINSTDA68LE |
| LAND ECONOMICS | NATIONAL COMMISSION ON URBAN PROBLEMS<br>REDUCING HOUSING COSTS<br>DNATCUP68BA105 |
| LAND OWNERSHIP | STRONG, ANNA LOUISE<br>FACTORS AFFECTING LAND TENURE ON THE URBAN FRINGE<br>YLAUC-A69SAFA |
| LAND RESOURCES | RUTH, HERMAN<br>TOWARD A NATIONAL POLICY FOR URBAN LAND DEVELOPMENT<br>ARUTHH.69TN |
| LAND TAX | NATIONAL COMMISSION ON URBAN PROBLEMS<br>GOVERNMENT STRUCTURE, FINANCE AND TAXATION<br>DNATCUP68BA104 |
| LAND USE | SAN DIEGO CO. COMPREHENSIVE PLANNING ORGANIZATION<br>STANDARD LAND USE CODE-SAN DIEGO REGION<br>OSANDCO68UL |
| LAND USE | U.K. HOUSING AND LOCAL GOVERNMENT MINISTRY<br>REPORT OF THE MINISTRY OF HOUSING AND LOCAL GOVERNMENT 1967 AND 1968<br>TUKMHLG69RM |
| LAND USE CONTROLS | NATIONAL COMMISSION ON URBAN PROBLEMS<br>CODES AND STANDARDS<br>DNATCUP68BA103 |
| LAND USE CONTROLS | PUERTO RICO. PLANNING BD.<br>PRESERVATION OF AGRICULTURAL LAND IN PUERTO RICO<br>GPUERPB68PA |
| LAND USE PLANS | BERKELEY, CALIF. REDEVELOPMENT AGENCY<br>REDEVELOPMENT PLAN FOR THE WEST BERKELEY INDUSTRIAL PARK PROJECT<br>KCALIBERA69RP |
| LAND USE PLANS | DELAWARE VALLEY REGIONAL PLANNING COMMISSION<br>REGIONAL LAND USE PLAN, 1985<br>OPHILDV68RL |
| LAND USE STUDY | PUERTO RICO. PLANNING BD.<br>PRESERVATION OF AGRICULTURAL LAND IN PUERTO RICO<br>GPUERPB68PA |
| LAW ENFORCEMENT | SOUTHERN CALIFORNIA ASSN. OF GOVERNMENTS<br>COMPREHENSIVE PLAN FOR CRIMINAL JUSTICE, REGION 10<br>OCALISA69RC |
| LAW ENFORCEMENT | CRIME COMMISSION OF PHILADELPHIA<br>ATTACK ON CRIME, DESIGN OF A REGIONAL APPROACH TO LAW ENFORCEMENT IN THE DELAWARE VALLEY<br>PPHILCC69AC |
| LEGISLATION | BERRY, BRIAN J.L.<br>NATIONAL EXPERIENCE<br>CCHICUS68IU102 |

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                                     MAJOR SUBJECT LISTING


LEGISLATION                     ADVISORY COMMISSION ON INTERGOVERNMENTAL RELATIONS
                                   TENTH ANNUAL REPORT, 1968
                                         DACIR..69AR

LEGISLATION                     CONNECTICUT. COMMUNITY AFFAIRS DEPT.
                                   CONNECTICUT HOUSING LEGISLATIVE STUDY
                                         GCONNCA69CH

LEGISLATION                     CANADA. CENTRAL MORTGAGE AND HOUSING CORP.
                                   ANNUAL REPORT
                                         TCENTMH69AR

LEGISLATION                     HOUSING REVIEW
                                   HOUSING BILL
                                         YHORV-A69..HB

LEGISLATION                     JOURNAL OF THE AIR POLLUTION CONTROL ASSN.
                                   1968 STATE LEGISLATION FOR POLLUTION CONTROL
                                         YJPCA-A69..SL

LEGISLATION                     ZIMMERMANN, FREDERICK L.
                                   INTERGOVERNMENTAL COMMISSIONS, THE INTERSTATE FEDERAL
                                       APPROACH
                                         YSGOV-A69ZFIC

LIBRARIES                       NEW YORK. CITY. CITY PLANNING COMMISSION
                                   NEW YORK CITY PUBLIC LIBRARIES. A NEW LOOK AND PROPOSED
                                       BUDGETING PRIORITIES.
                                         KNEWYCP..68NY

LIVING REQUIREMENTS             NATIONAL SWEDISH INSTITUTE FOR BUILDING RESEARCH
                                   FLEXIBLE DWELLINGS HAVE MANY ADVANTAGES
                                         YBLIN-B69NSFD

LOCATION THEORY                 WALTERS, JOE P.
                                   PLANNED RESEARCH AND DEVELOPMENT DISTRICTS
                                         YAICJ-B69WJPR

LOCATION THEORY                 MCCLELLAN, KEITH
                                   OUTDOOR RECREATION.ECONOMIC CONSIDERATION FOR OPTIMAL
                                       SITE SELECTION AND DEVELOPMENT
                                         YLAEC-A69MKOR

LOW-COST HOUSING                INSTITUTE FOR DEFENSE ANALYSES. PROGRAM ANALYSIS DIV.
                                   COST-REDUCING CONDOMINIUM SYSTEMS FOR LOW COST ROOMS
                                         AINSTDA68CR

LOW-COST HOUSING                INSTITUTE FOR DEFENSE ANALYSES. PROGRAM ANALYSIS DIV.
                                   SUPPLY CONDITIONS FOR LOW-COST HOUSING PRODUCTION
                                         AINSTDA68SC

LOW-COST HOUSING                ALASKA. STATE HOUSING AUTHORITY
                                   LOW-INCOME HOUSING DEMONSTRATION PROGRAM, GRAYLING,
                                       METLAKATLA AND BETHEL, ALASKA
                                         GALASSH68LI

LOW-COST HOUSING                RESTON VIRGINIA FOUNDATION FOR COMMUNITY PROGRAMS
                                   RESTON LOW INCOME HOUSING DEMONSTRATION PROGRAM
                                         PRESTCP69RL

LOW-COST LOANS                  NATIONAL COMMISSION ON URBAN PROBLEMS
                                   HOUSING PROGRAMS
                                         DNATCUP68BA102

LOW-RENT HOUSING                CONTINUED
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| LOW-RENT HOUSING | CONTINUED<br>OBLOCK, ROBERT<br>LOW INCOME HOUSING<br>CHARVPT69SI106 |
| MAPPING | COUNCIL OF PLANNING LIBRARIANS. EXCHANGE BIBLIOGRAPHY<br>INTERDISCIPLINARY APPROACH TO REGIONAL PLANNING<br>BCOPLEB69FJIR |
| MASS TRANSPORTATION | TRI-COUNTY REGIONAL PLANNING COMMISSION, LANSING, MICH.<br>MASS TRANSPORTATION IN THE TRI-COUNTY REGION, DEVELOPMENT PLAN AND IMPROVEMENT PROGRAM<br>OMICHTC69MT |
| MATHEMATICAL ANALYSIS | INSTITUTE FOR DEFENSE ANALYSES. PROGRAM ANALYSIS DIV.<br>LAND AS AN ELEMENT OF HOUSING COSTS;<br>AINSTDA68LE |
| METHODOLOGY | NEW YORK. STATE. OFFICE OF PLANNING COORDINATION<br>INTERINDUSTRY STUDIES AND MODEL DEVELOPMENT<br>GNEWYPC69IS |
| METHODOLOGY | PUERTO RICO. PLANNING BD.<br>PRESERVATION OF AGRICULTURAL LAND IN PUERTO RICO<br>GPUERPB68PA |
| METHODOLOGY | ATLANTA REGION METROPOLITAN PLANNING COMMISSION<br>STEPS TOWARD DECISION<br>OATLAMP69ST |
| METHODOLOGY | TOLEDO REGIONAL AREA PLAN FOR ACTION<br>STUDY OF COMMUNITY ATTITUDES AND PREFERENCES IN THE TOLEDO REGIONAL AREA<br>OTOLERA69CA |
| METHODOLOGY | MILLER, H.W., JR.<br>BUILD HIGH BUT COMBINE EFFICIENCY WITH SPEED AND ECONOMY<br>YBLIN-B69MHBH |
| METROPOLITAN AREA PLAN | METROPOLITAN COUNCIL OF THE TWIN CITIES AREA, SAINT PAUL<br>METROPOLITAN OPEN SPACE SYSTEM<br>OSTPLMC69MO |
| METROPOLITAN AREAS | RUTH, HERMAN<br>TOWARD A NATIONAL POLICY FOR URBAN LAND DEVELOPMENT<br>ARUTHH.69TN |
| METROPOLITAN AREAS | WALSH, ANNMARIE HAUCK<br>URBAN CHALLENGE TO GOVERNMENT, AN INTERNATIONAL COMPARISON OF THIRTEEN CITIES<br>AWALSAH69UC |
| METROPOLITAN AREAS | NATIONAL COMMISSION ON URBAN PROBLEMS<br>GOVERNMENT STRUCTURE, FINANCE AND TAXATION<br>DNATCUP68BA104 |
| MIGRATION | LEVIN, MELVIN R.<br>COMMUNITY AND REGIONAL PLANNING, ISSUES IN PUBLIC POLICY<br>ALEVIMR69CR |
| MOBILE HOUSING | ARCHITECTURAL FORUM<br>TOWARDS A MOVABLE, LIVABLE MOBILE HOME<br>YACUF-A69..TM |
| MODEL CITIES PROGRAM | NEW YORK. CITY. MODEL CITIES-CENTRAL BROOKLYN<br>CONTINUED |

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                              MAJOR SUBJECT LISTING

MODEL CITIES PROGRAM        CONTINUED
                               BROWNSVILLE PHYSICAL REDEVELOPMENT PLAN, A REPORT TO THE
                                  PEOPLE
                                    KNEWYMCCB69BP

MODEL CITIES PROGRAM        NEW YORK. CITY. MODEL CITIES-CENTRAL BROOKLYN
                               PHASE 2 PLAN, EAST NEW YORK MODEL CITIES
                                    KNEWYMCCB69PP

MODEL CITIES PROGRAM        NEW YORK. CITY. MODEL CITIES-HARLEM-EAST HARLEM
                               PARTNERSHIP FOR PROGRESS
                                    KNEWYMCHE69PP

MODELS                      INSTITUTE FOR DEFENSE ANALYSES. PROGRAM ANALYSIS DIV.
                               SUPPLY CONDITIONS FOR LOW-COST HOUSING PRODUCTION
                                    AINSTDA68SC

MODELS                      NEW YORK. STATE. OFFICE OF PLANNING COORDINATION
                               INTERINDUSTRY STUDIES AND MODEL DEVELOPMENT
                                    GNEWYPC69IS

MODELS                      CRIPPS, ERIC L.
                               MANAGEMENT SYSTEM FOR PLANNING
                                    YTPIN-A69CEMS

MODULAR COORDINATION        RESTON VIRGINIA FOUNDATION FOR COMMUNITY PROGRAMS
                               RESTON LOW INCOME HOUSING DEMONSTRATION PROGRAM
                                    PRESTCP69RL

MODULAR COORDINATION        ARCHITECTURAL FORUM
                               TOWARDS A MOVABLE, LIVABLE MOBILE HOME
                                    YACUF-A69..TM

MORES                       MARON, M.E.
                               LARGE SCALE DATA BANKS
                                    YSPLB-A69MMDB

MORTGAGE FINANCING          CANADA. CENTRAL MORTGAGE AND HOUSING CORP.
                               ANNUAL REPORT
                                    TCENTMH69AR

MORTGAGE FINANCING          CANADA. CENTRAL MORTGAGE AND HOUSING CORP. ECONOMICS AND
                               STATISTICS DIV.
                               CANADIAN HOUSING STATISTICS 1968
                                    TCENTMH69CS

MUNICIPAL FINANCE           NATIONAL COMMISSION ON URBAN PROBLEMS
                               GOVERNMENT STRUCTURE, FINANCE AND TAXATION
                                    DNATCUP68BA104

MUNICIPAL FINANCE           MEYERS, HAROLD B.
                               TAX EXEMPT PROPERTY, ANOTHER CRUSHING BURDEN FOR THE
                                  CITIES
                                    YFORT-A69MHTE

MUNICIPAL FINANCE           FINANCIAL CRISIS OF OUR CITIES CONFERENCE, 1968
                               FINANCING OUR URBAN NEEDS
                                    YNACI-B69FCFU

MUNICIPAL FINANCE           HARKINS, PETER B.
                               HOW WOULD REVENUE SHARING WORK
                                    YNACI-B69HPRS

MUNICIPAL GOVERNMENT        WALSH, ANNMARIE HAUCK
                               URBAN CHALLENGE TO GOVERNMENT, AN INTERNATIONAL COMPARISON
                            CONTINUED
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| MUNICIPAL GOVERNMENT | CONTINUED<br>OF THIRTEEN CITIES<br>AWALSAH69UC |
| MUNICIPAL GOVERNMENT | SCHMANDT, JUERGEN<br>URBAN CRISIS<br>CHARVPT69SI101 |
| MUNICIPAL GOVERNMENT | NATIONAL COMMISSION ON URBAN PROBLEMS<br>GOVERNMENT STRUCTURE, FINANCE AND TAXATION<br>DN TCUP68BA104 |
| MUNICIPAL GOVERNMENT | U.K. HOUSING AND LOCAL GOVERNMENT MINISTRY<br>REPORT OF THE MINISTRY OF HOUSING AND LOCAL GOVERNMENT<br>1967 AND 1968<br>TUKMHLG69RM |
| NEGROES | HAMPDEN-TURNER, CHARLES<br>BLACK POWER. A BLUEPRINT FOR PSYCHO-SOCIAL DEVELOPMENT<br>CHARVPT69SI104 |
| NEGROES | MIAMI. UNIV. CENTER FOR ADVANCED INTERNATIONAL STUDIES<br>PSYCHO-SOCIAL DYNAMICS IN MIAMI<br>CMIAMCA69PS |
| NEIGHBORHOOD ANALYSES | RAINSVILLE, ALA. PLANNING COMMISSION<br>NEIGHBORHOOD ANALYSIS, COMMUNITY FACILITIES PLAN, PUBLIC IMPROVEMENTS AND CAPITAL BUDGET, RAINSVILLE, ALA.<br>KALABRAPC69NA |
| NEIGHBORHOOD ANALYSES | WARNER ROBINS, GA. PLANNING COMMISSION<br>NEIGHBORHOOD ANALYSES, WARNER ROBINS, GA.<br>KGECRWRPC69NA |
| NEIGHBORHOOD ANALYSES | APEX, N.C. PLANNING BD.<br>NEIGHBORHOOD ANALYSIS, APEX, N.C.<br>KNCRCAPPB69NA |
| NEIGHBORHOOD DEVEL PROG | NEW YORK. CITY. CITY PLANNING COMMISSION<br>BETWEEN PROMISE AND PERFORMANCE<br>KNEWYCP..68BP |
| NEIGHBORHOOD PARKS | NEW YORK. CITY. CITY PLANNING COMMISSION<br>RECREATION FACILITIES IN NEW YORK CITY. A METHOD OF ASSIGNING BUDGETARY PRIORITIES<br>KNEWYCP..68RF |
| NEIGHBORHOODS | NATIONAL COMMISSION ON URBAN PROBLEMS<br>GOVERNMENT STRUCTURE, FINANCE AND TAXATION<br>DNATCUP68BA104 |
| NEW COMMUNITIES | ONTARIO HOUSING<br>NEW 330 MILLION BALANCED COMMUNITY<br>YONHO-A69..MM |
| NEW TOWNS | HARVARD UNIV. GRADUATE SCHOOL OF DESIGN. NEW COMMUNITIES PROJECT<br>NEW COMMUNITIES, ONE ALTERNATIVE. A HARVARD STUDY OF A NEW CITY<br>CHARVDS68NC |
| NEW TOWNS | U.K. HOUSING AND LOCAL GOVERNMENT MINISTRY<br>REPORT OF THE MINISTRY OF HOUSING AND LOCAL GOVERNMENT<br>1967 AND 1968<br>TUKMHLG69RM |

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NEW TOWNS                    MORRIS, ROBERT L.
                                IMPACT OF NEW TOWNS, PART 1
                                      YNACI-B69MRIN

NEW TOWNS                    WELSH, JAMES
                                EUROPES NEW TOWNS-ROUND THREE COMING UP
                                      YTHNK-A69WJEN

NEW TOWNS                    ABEND, NORMAN A.
                                TRANSPORTATION INPUTS IN NEW TOWN PLANNING
                                      YTRAC-A69ANTI

NON-PROFIT HOUSING           URBAN AMERICA INC.
                                NON-PROFIT HOUSING CENTER
                                      BURBAA.69NH

OPEN SPACE PLANS             METROPOLITAN COUNCIL OF THE TWIN CITIES AREA, SAINT PAUL
                                METROPOLITAN OPEN SPACE SYSTEM
                                      OSTPLMC69MO

OUTDOOR RECREATION           OUTDOOR RECREATION BUR.
                                INDEX OF SELECTED OUTDOOR RECREATION LITERATURE
                                      DOUTDRB69IS

OUTDOOR RECREATION           U.K. HOUSING AND LOCAL GOVERNMENT MINISTRY
                                REPORT OF THE MINISTRY OF HOUSING AND LOCAL GOVERNMENT
                                   1967 AND 1968
                                      TUKMHLG69RM

OUTDOOR RECREATION           MCCLELLAN, KEITH
                                OUTDOOR RECREATION.ECONOMIC CONSIDERATION FOR OPTIMAL
                                   SITE SELECTION AND DEVELOPMENT
                                      YLAEC-A69MKOR

PARKING FACILITIES           TOLEDO REGIONAL AREA PLAN FOR ACTION
                                SURVEY OF PARKING SPACE USE IN THE TOLEDO REGIONAL AREA
                                      OTOLERA69PS

PARKS                        CHICAGO. DEVELOPMENT AND PLANNING DEPT.
                                JACKSON PARK, BURNHAM PARK AND LAKE SHORE DRIVE, BETWEEN
                                   47TH AND 67TH STREETS
                                      KCHICDP..69JP

PARKS                        CORNELL, RALPH D.
                                GARDENS FOR THE BLIND, ITS WHAT YOU DO NOT SEE THAT COUNTS
                                      YLSAR-A69CRGB

PERFORMANCE STANDARDS        KARLEN, INGVAR
                                QUALITY, PHILOSOPHY AND ASSESSMENT IN SWEDEN
                                      YBLIN-B69KIQP

PERSON IDENTIFICATION        MARON, M.E.
                                LARGE SCALE DATA BANKS
                                      YSPLB-A69MMDB

PLAN IMPLEMENTATION          ASPO PLANNING ADVISORY SERVICE
                                CONSERVATION OF HISTORIC AND CULTURAL RESOURCES
                                      BASPOPA69MRCH

PLAN IMPLEMENTATION          HARVARD UNIV. GRADUATE SCHOOL OF DESIGN. NEW COMMUNITIES
                                PROJECT
                                NEW COMMUNITIES, ONE ALTERNATIVE. A HARVARD STUDY OF
                                   A NEW CITY
                                      CHARVDS68NC
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| PLAN IMPLEMENTATION | NEW ORLEANS. MAYOR<br>PLAN AND PROGRAM FOR THE PRESERVATION OF THE VIEUX CARRE<br>KNEWOM...68PP |
| PLAN IMPLEMENTATION | MARION CO., IND. METROPOLITAN PLANNING DEPT.<br>METROPOLITAN SUBAREA PLAN, HIGHLAND BROOKSIDE<br>LINDIMAMP69MS |
| PLAN IMPLEMENTATION | TRI-COUNTY REGIONAL PLANNING COMMISSION, LANSING, MICH.<br>MASS TRANSPORTATION IN THE TRI-COUNTY REGION, DEVELOPMENT PLAN AND IMPROVEMENT PROGRAM<br>CMICHTC69MT |
| PLANNED UNITS | NATIONAL COMMISSION ON URBAN PROBLEMS<br>CODES AND STANDARDS<br>DNATCUP68BA103 |
| PLANNED UNITS | CORAL GABLES, FLA. CITY COMMISSION<br>PLAN IMPLEMENTATION FOR THE COMPREHENSIVE DEVELOPMENT PLAN, CORAL GABLES, FLORIDA<br>KFLCRCGCC69PI |
| PLANNED UNITS | SILER CITY, N.C. BOARD OF COMMISSIONERS<br>ZONING ORDINANCE, SILER CITY, N.C.<br>KNORCSIBC69ZO |
| PLANNING ADMINISTRATION | ASPO PLANNING ADVISORY SERVICE<br>EXPENDITURE, STAFF AND SALARIES OF PLANNING AGENCIES<br>BASPOPA69FPES |
| PLANNING ADMINISTRATION | CORAL GABLES, FLA. CITY COMMISSION<br>PLAN IMPLEMENTATION FOR THE COMPREHENSIVE DEVELOPMENT PLAN, CORAL GABLES, FLORIDA<br>KFLCRCGCC69PI |
| PLANNING ADMINISTRATION | U.K. HOUSING AND LOCAL GOVERNMENT MINISTRY<br>REPORT OF THE MINISTRY OF HOUSING AND LOCAL GOVERNMENT 1967 AND 1968<br>TUKMHLG69RM |
| PLANNING COMMISSIONS | NATIONAL SERVICE TO REGIONAL COUNCILS<br>REGIONAL COUNCIL PROFILES<br>BNSRC..69RC |
| PLANNING LIBRARIES | WHITE, BRENDA<br>INFORMATION FOR PLANNING<br>AWHITB.69IP |
| PLANNING LIBRARIES | COUNCIL OF PLANNING LIBRARIANS<br>DIRECTORY OF LIBRARIES<br>BCOPL..69DL |
| PLANNING PROCESS | MOREHOUSE, THOMAS A.<br>THE 1962 HIGHWAY ACT, A STUDY IN ARTFUL INTERPRETATION<br>YAIPJ-A69MTHA |
| PLANNING PROFESSION | LEVIN, MELVIN R.<br>COMMUNITY AND REGIONAL PLANNING, ISSUES IN PUBLIC POLICY<br>ALEVIMR69CR |
| PLANNING PROFESSION | WHITE, BRENDA<br>INFORMATION FOR PLANNING<br>AWHITB.69IP |
| POLICE PLANNING | CONTINUED |

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| POLICE PLANNING | CONTINUED<br>SOUTHERN CALIFORNIA ASSN. OF GOVERNMENTS<br>COMPREHENSIVE PLAN FOR CRIMINAL JUSTICE, REGION 10<br>OCALISA69RC |
| POLICE PLANNING | CRIME COMMISSION OF PHILADELPHIA<br>ATTACK ON CRIME, DESIGN OF A REGIONAL APPROACH TO LAW ENFORCEMENT IN THE DELAWARE VALLEY<br>PPHILCC69AC |
| POLITICS | THERNSTROM, STEPHAN<br>POVERTY, PLANNING AND POLITICS IN THE NEW BOSTON. ORIGINS OF ABCD<br>ATHERS.69PP |
| POLITICS | CAMPBELL, LOUISE<br>PAUL YLVISAKER, THE ART OF THE IMPOSSIBLE<br>YCITY-A69CLPY |
| POPULATION CHARACTERISTICS | SEATTLE. HOUSING AUTHORITY<br>ANNUAL TENANT CENSUS-DECEMBER 31, 1968<br>KSEATHA..69AT |
| POPULATION CHARACTERISTICS | WESTCHESTER CO., N.Y. PLANNING DEPT.<br>POPULATION, 1985<br>LNEWYWEPD69PO |
| POPULATION PROJECTIONS | NATIONAL COMMISSION ON URBAN PROBLEMS<br>URBAN SETTING. POPULATION, POVERTY, RACE<br>DNATCUP68BA101 |
| POPULATION PROJECTIONS | WESTCHESTER CO., N.Y. PLANNING DEPT.<br>POPULATION, 1985<br>LNEWYWEPD69PO |
| POPULATION PROJECTIONS | DENVER REGIONAL COUNCIL OF GOVERNMENTS<br>POPULATION, CURRENT ESTIMATES AND PROJECTIONS, DENVER SMSA<br>ODENVRC69PC |
| POVERTY PROGRAMS | LEVIN, MELVIN R.<br>COMMUNITY AND REGIONAL PLANNING, ISSUES IN PUBLIC POLICY<br>ALEVIMR69CR |
| POVERTY PROGRAMS | THERNSTROM, STEPHAN<br>POVERTY, PLANNING AND POLITICS IN THE NEW BOSTON. ORIGINS OF ABCD<br>ATHERS.69PP |
| POVERTY PROGRAMS | MIAMI. UNIV. CENTER FOR ADVANCED INTERNATIONAL STUDIES<br>PSYCHO-SOCIAL DYNAMICS IN MIAMI<br>CMIAMCA69PS |
| PPBS | NATIONAL ASSN. OF STATE BUDGET OFFICERS<br>STATE BUDGETING FOR COMPREHENSIVE HEALTH SERVICE PLANNING<br>BNASBO.68SP |
| PPBS | NATIONAL ASSN. OF STATE BUDGET OFFICERS<br>BUDGETS FOR STATE PLANNING<br>BNASBO.69BS |
| PPBS | GROSS, BERTRAM M.<br>PLANNING-PROGRAMMING-BUDGETING SYSTEM REAXAMINED. DEVELOPMENT, ANALYSIS AND CRITICISM<br>YPBAR-B69GBSB |

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| PREFABRICATION | INSTITUTE FOR DEFENSE ANALYSES. PROGRAM ANALYSIS DIV.<br>SUPPLY CONDITIONS FOR LOW-COST HOUSING PRODUCTION<br>AINSTDA68SC |
| PREFABRICATION | NATIONAL COMMISSION ON URBAN PROBLEMS<br>REDUCING HOUSING COSTS<br>DNATCUP68BA105 |
| PRIVATE SECTOR | HARVARD UNIV. PROGRAM ON TECHNOLOGY AND SOCIETY<br>SOCIAL INNOVATION IN THE CITY<br>CHARVPT69SI |
| PRIVATE SECTOR | MARRIS, ROBIN<br>BUSINESS, ECONOMICS AND SOCIETY<br>CHARVPT69SI102 |
| PRIVATE SECTOR | GOLDSTON, ELI<br>BUSINESSMAN AND THE URBAN CRISIS<br>YATER-A69GEBU |
| PRIVATE SECTOR | CRAWFORD, DANA<br>ECONOMICS OF REHABILITATED DOWNTOWN AREAS<br>YHISP-A69CDER |
| PROJECT PLANNING | NEW YORK. CITY. MODEL CITIES-CENTRAL BROOKLYN<br>BROWNSVILLE PHYSICAL REDEVELOPMENT PLAN. A REPORT TO THE PEOPLE<br>KNEWYMCCB69BP |
| PROTEST ACTION | HAMPDEN-TURNER, CHARLES<br>BLACK POWER. A BLUEPRINT FOR PSYCHO-SOCIAL DEVELOPMENT<br>CHARVPT69SI104 |
| PUBLIC HOUSING | NATIONAL COMMISSION ON URBAN PROBLEMS<br>HOUSING PROGRAMS<br>DNATCUP68BA102 |
| PUBLIC HOUSING | SEATTLE. HOUSING AUTHORITY<br>ANNUAL TENANT CENSUS-DECEMBER 31, 1968<br>KSEATHA..69AT |
| PUBLIC IMPROVEMENTS | RAINSVILLE, ALA. PLANNING COMMISSION<br>NEIGHBORHOOD ANALYSIS, COMMUNITY FACILITIES PLAN, PUBLIC IMPROVEMENTS AND CAPITAL BUDGET, RAINSVILLE, ALA.<br>KALABRAPC69NA |
| PUBLIC OFFICIALS | METROPOLITAN WASHINGTON COUNCIL OF GOVERNMENTS<br>REGIONAL DIRECTORY 1969<br>ODCMWCG69RD |
| PUBLIC OFFICIALS | CAMPBELL, LOUISE<br>PAUL YLVISAKER, THE ART OF THE IMPOSSIBLE<br>YCITY-A69CLPY |
| PUBLIC OPINION | TOLEDO REGIONAL AREA PLAN FOR ACTION<br>STUDY OF COMMUNITY ATTITUDES AND PREFERENCES IN THE TOLEDO REGIONAL AREA<br>OTOLERA69CA |
| PUBLICATIONS LISTS | MINNESOTA. STATE PLANNING AGENCY<br>BIENNIAL REPORT TO THE MINNESOTA LEGISLATURE, 1967-69<br>GMINNSP69BR |
| PUBLICATIONS LISTS | INSTITUTE FOR COMMUNITY STUDIES, KANSAS CITY<br>CONTINUED |

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                              MAJOR SUBJECT LISTING

PUBLICATIONS LISTS          CONTINUED
                               ANNUAL REPORT
                                     PINSTCS69AR

QUALITY CONTROL             KARLEN, INGVAR
                               QUALITY, PHILOSOPHY AND ASSESSMENT IN SWEDEN
                                     YBLIN-B69KIQP

QUALITY CONTROL             SITTIG, J.
                               QUALITY IN BUILDING
                                     YBLIN-B69SJQB

QUESTIONNAIRES              CENTRAL CONNECTICUT REGIONAL PLANNING AGENCY
                               RECOMMENDED HOUSING POLICIES
                                     OCONNCC69RH

RACE RELATIONS              HAMPDEN-TURNER, CHARLES
                               BLACK POWER. A BLUEPRINT FOR PSYCHO-SOCIAL DEVELOPMENT
                                     CHARVPT69SI104

RACE RELATIONS              MIAMI. UNIV. CENTER FOR ADVANCED INTERNATIONAL STUDIES
                               PSYCHO-SOCIAL DYNAMICS IN MIAMI
                                     CMIAMCA69PS

REAL PROPERTY TAXES         INSTITUTE FOR DEFENSE ANALYSES. PROGRAM ANALYSIS DIV.
                               LAND AS AN ELEMENT OF HOUSING COSTSJ
                                     AINSTDA68LE

REAL PROPERTY TAXES         NATIONAL COMMISSION ON URBAN PROBLEMS
                               GOVERNMENT STRUCTURE, FINANCE AND TAXATION
                                     DNATCUP68BA104

REAL PROPERTY TAXES         MEYERS, HAROLD B.
                               TAX EXEMPT PROPERTY, ANOTHER CRUSHING BURDEN FOR THE
                                  CITIES
                                     YFORT-A69MHTE

RECREATIONAL FACILITIES     NEW YORK. CITY. CITY PLANNING COMMISSION
                               RECREATION FACILITIES IN NEW YORK CITY. A METHOD OF
                                  ASSIGNING BUDGETARY PRIORITIES
                                     KNEWYCP..68RF

REFORMS                     SCHMANDT, JUERGEN
                               URBAN CRISIS
                                     CHARVPT69SI101

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REGIONAL PLANNING           NATIONAL SERVICE TO REGIONAL COUNCILS
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| REGIONAL PLANNING | GARVEY, JOHN, JR.<br>WHAT CAN EUROPE TEACH US ABOUT URBAN GROWTH<br>YNACI-B69GJET |
| REHABILITATION | NEW YORK. CITY. CITY PLANNING COMMISSION<br>BETWEEN PROMISE AND PERFORMANCE<br>KNEWYCP..68BP |
| REHABILITATION | MARION CO., IND. METROPOLITAN PLANNING DEPT.<br>HOUSING AND URBAN RENEWAL -2<br>LINDIMAMP68HUB |
| REHABILITATION | GOLDSTON, ELI<br>BUSINESSMAN AND THE URBAN CRISIS<br>YATER-A69GEBU |
| REHABILITATION | CRAWFORD, DANA<br>ECONOMICS OF REHABILITATED DOWNTOWN AREAS<br>YHISP-A69CDER |
| REHABILITATION | HOUSING REVIEW<br>HOUSING BILL<br>YHORV-A69..HB |
| REHABILITATION AREAS | NEW ORLEANS. MAYOR<br>PLAN AND PROGRAM FOR THE PRESERVATION OF THE VIEUX CARRE<br>KNEWCM...68PP |
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| RELOCATION | CHICAGO. UNIV. CENTER FOR URBAN STUDIES<br>IMPACT OF URBAN RENEWAL ON SMALL BUSINESS<br>CCHICUS68IU |
| RELOCATION | NATIONAL COMMISSION ON URBAN PROBLEMS<br>HOUSING PROGRAMS<br>DNATCUP68BA102 |
| RELOCATION STANDARDS | NATIONAL ASSN. OF HOUSING AND REDEVELOPMENT OFFICIALS<br>CENTRALIZED RELOCATION, A NEW MUNICIPAL SERVICE<br>BNAHRO.69CR |
| REMOTE SENSORS | GORSCHBOTH, FREDERICK F.<br>CONTROLLING AIR POLLUTION<br>YNACI-B69GFCA |
| RENEWAL | NATIONAL COMMISSION ON URBAN PROBLEMS<br>HOUSING PROGRAMS<br>DNATCUP68BA102 |
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| RENEWAL AREAS | BERKELEY, ELLEN PERRY<br>URBAN RENEWAL NEED NOT BE A DIRTY WORD<br>YACUF-A69BEUR |
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                                 ADMINISTRATIVE GUIDE TO SUBDIVISION REGULATIONS
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| TAX BASE | MEYERS, HAROLD B.<br>TAX EXEMPT PROPERTY, ANOTHER CRUSHING BURDEN FOR THE CITIES<br>YFORT-A69MHTE |
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| TRAINING PROGRAMS | URBAN AMERICA INC.<br>NON-PROFIT HOUSING CENTER<br>BURBAA.69NH |
| TRANSPORT TECHNOLOGY | METROPOLITAN<br>GRAVITY-VACUUM TRANSIT TRAIN<br>YMTPC-A69..GV |
| TRANSPORTATION PLANNING | TRI-COUNTY REGIONAL PLANNING COMMISSION, LANSING, MICH.<br>MASS TRANSPORTATION IN THE TRI-COUNTY REGION, DEVELOPMENT PLAN AND IMPROVEMENT PROGRAM<br>DMICHTC69MT |
| TRANSPORTATION PLANNING | ABEND, NORMAN A.<br>TRANSPORTATION INPUTS IN NEW TOWN PLANNING<br>YTRAC-A69ANTI |
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| UNDERPRIVILEGED | NATIONAL COMMISSION ON URBAN PROBLEMS<br>URBAN SETTING. POPULATION, POVERTY, RACE<br>DNATCUP68BA101 |
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139 BOSWELL AVE., NORWICH, CONN. 06360

CAPITAL IMPROVEMENTS
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